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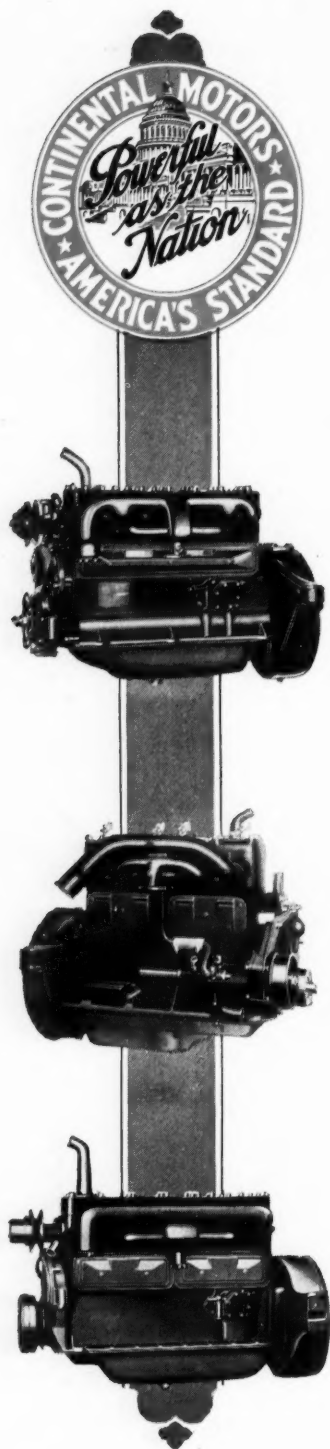
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Automobile Time Sales Aired by U. S. Chamber of Commerce

Wisdom of present practices questioned by several speakers
at Washington meeting. Industrial relations, highway
traffic, commercial air transport discussed.

By Norman G. Shidle

OUT of the multitudinous papers and discussions and the avalanche of words and ideas on extremely diversified subjects which were propounded and argued at the Fourteenth Annual meeting of the Chamber of Commerce of the United States, at Washington, May 10-13, eleven points appear of particular importance to the automotive industry:

1. The wisdom of pushing instalment buying in general and automobile instalment buying in particular to the limits now current was questioned seriously by several bankers and practically condemned by one.

2. Capt. E. V. Rickenbacker predicted that aviation would not really be commercialized by the present generation of business men, but that eventually it would be as large or larger than the automotive industry is today.

3. The U. S. Chamber of Commerce went on record as definitely opposing compulsory automobile liability insurance.

4. The liberalizing and broadening in viewpoint of executives in approaching problems of industrial relations, which has been going on for a number of years, was very clearly shown by the strong approval with which manufacturers at the meeting indorsed expressions of opinion favoring continuance of high wages as long as economically possible and a policy of showing employees as much about the general problems of the business as possible.

Self-Regulation in Business

5. The policy of opposing governmental interference in business which always has been a part of the U. S. Chamber of Commerce program was emphasized again, stress being laid on the necessity of self-regulation in business if governmental interference is to be avoided.

6. Further study of traffic problems and further activity in coordination of various types of transport agencies was urged in order to

create greater safety and efficiency in the use of the highways and of the vehicles operated on the highways.

7. Business men were urged to make the fullest practicable use of commercial air transport and passage of Federal legislation now before Congress relating to regulation and promotion of commercial aviation development was advocated.

8. The U. S. Chamber went on record as asking that all possible steps be taken to facilitate, through international highway conferences, the exchange of knowledge respecting all phases of highway development.

9. Several resolutions pertaining to automotive subjects were not included in the final set of resolutions presented to the meeting by the resolutions committee, but were, instead, referred back to committees or other agencies for further study. In this group were proposals regarding regulation of common carriers on the highways, regarding traffic signals, and regarding Federal excise taxes.

10. Statements from leading agriculturists that the situation of the farmer is not particularly good at present, but that improvement may be looked for, have a bearing on sales probabilities for motor vehicles in rural sections.

11. Frederick J. Haynes, chairman of the board, Dodge Bros., Inc., was reelected as a director of the U. S. Chamber of Commerce.

The need for a better knowledge of markets and of means and methods of distribution, in view of the changing character of trade brought about by hand-to-mouth buying, greater purchasing power and greater concentration of population was stressed by E. M. West, New York economist, in explaining before the domestic distribution group the uses to which a national census of distribution might be put. Resolutions passed by the group and afterward by the Chamber called for a national census of this kind.

Competition Weakening Time Sales Structure

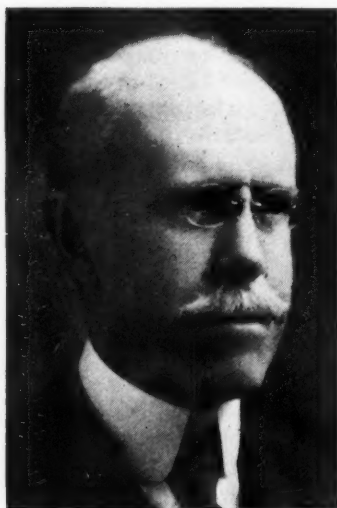
O. H. Cheney says warfare in rates has placed automobile industry in position of selling credit.

INSTALMENT selling came in for a generous share of attention at the convention, and the limelight was thrown strongly upon automobile time sales at the domestic distribution group session, when O. H. Cheney, vice-president, American Exchange-Pacific National Bank of New York, made a vigorous criticism of present methods and tendencies in the financing of automobile purchases. Speaking extemporaneously, Alfred Reeves, general manager, National Automobile Chamber of Commerce, replied to the principal points made by Mr. Cheney.

Describing instalment selling in general as the strategy of bitter warfare, with the spirit of "jazz economics," Mr. Cheney declared that a "casual glance at the automobile financing field finds chaos," adding:

Selling Instalment Contracts

"As a result of ruthless competition in rates and terms the automobile business today is no longer selling automobiles—it is selling instalment contracts."



George W. Norris

MR. NORRIS, who is governor of the Federal Reserve Bank of Philadelphia, took a friendlier attitude toward instalment sales. "There is no use of running counter to a great current which has its source in the very well-springs of human nature," is the tolerant way he expressed his views. If the instalment buying habit needs curbing, he thinks education will have to do the job

Taking issue with Mr. Cheney, Mr. Reeves said that, of course, no one would defend the granting of credit beyond the means of the purchaser, but he stated that on the whole automobile time sales have been kept on a sound basis.

Citing the low ratios of the finance companies, Mr. Reeves pointed out that in anthracite coal regions during the strike only 17 cars were repossessed. Some purchasers were unable to keep up payments, and the dealers took back the cars temporarily, but payments were resumed when the miners went back to work.

Mr. Reeves also pointed out that in automobile time selling, as distinguished from methods in other trades, the cash purchaser does not have to absorb part or all of the costs of extending credit. So far from chaotic are the fundamental conditions of the automobile industry, he said, that the industry stands at the head of manufacturing in the United States and with a much lower bonded debt than any of the industries next in

line of importance. Most opposition to instalment selling, Mr. Reeves said, comes from interests unable to profit by the system.

Evidence of the conflicting opinions or indecision of a majority of the Chamber members was seen when the group declined to pass any resolutions on the subject.

A somewhat friendlier attitude toward time sales was expressed by George W. Norris, governor, Federal Reserve Bank of Philadelphia, who said in part:

"There is no use of running counter to a great current which has its source in the very well-springs of human nature. In this country we have been enjoying for the last four years a period of great prosperity, during which the purchasing power of the masses has been greater than ever before in our history. We have a natural inclination or predisposition to buy, encouraged and developed by an incredible mass of seductive advertising. Hitherto this inclination has been curbed by lack of the money with which to pay. Now this barrier has been broken down.

"Who is to apply the brake? Not the dealer who finds that it increases his sales. Not the manufacturer whose god is quantity production. Not the credit company whose livelihood is dependent upon it. Not the bank, which finds the business profitable and knows that a competitor would be glad to get it. Who then? It seems to me that it must be a process of gradual education in which the schools, the churches, the press and all other moulders of public opinion must do their part."

Cheney's Address

MR. CHENEY presented almost a scathing arrangement of the instalment selling situation as it has been built up and developed under automotive auspices.

Stating that other industries are looking with admiration at the automotive achievement, Mr. Cheney went on:

"But what are the facts about automobile instalment selling?

"When we look at instalment selling in the automobile industry we do not find everything reassuring. There are many visible flaws in the machinery—we hear the sound of straining and tearing.

"The automobile industry was not always committed to instalment selling as it is now.

"The carrying of time-payments is now almost entirely in the hands of finance companies, of which many hundreds have sprung up in the past two or three years. There are many types of such companies, with different types of business, different affiliations and different methods of operation.

"In general the methods of operation are of two types, recourse and non-recourse. The former makes the dealer liable in case of default because he indorses the paper—the latter places on the financing company sole liability. In actual practice such a web of his-sounding words and legal phrases has been woven around the terms that in many cases the dealer does not realize just what he is getting.

"Good profits made by the earlier finance companies attracted a great many small, hastily organized, concerns into the field and competition for the past two years

may justly be described as cut-throat. Naturally, the liberalization of terms has been accompanied by perfunctory investigation and fewer rejections of applications. As a result, repossession costs have increased, collection costs increased and losses increased.

"But these have not yet become painfully high because the country has been prosperous and there have been comparatively few defaults. In fact, based on actual experience so far, the money losses have been generally less than one per cent. These loss figures have been widely quoted to prove the soundness of instalment selling.

Do Loss Ratios Mean Anything?

"The records of one leading finance corporation for the past seven years show loss ratios for every year of less than one per cent. In 1920 the ratio went up to 0.918 of one per cent. In 1924 it was 0.097 of one per cent and last year about 0.012 of one per cent. But since the 1920 depression, the volume of this company's business has quadrupled and nobody knows to what extent its customers have incurred other obligations in the present instalment boom. I do not know how much of a guide these loss ratios really are.

"Closer analysis of the combined and actual records for a number of finance companies show very definitely how repossessions and losses have increased to a marked degree as down-payments have been reduced and terms extended. The loss ratio ranges from 0.163 per cent on cars sold at one-third down and twelve months to pay up to 4.583 per cent on cars sold at less than one-fourth down and nineteen or more months to pay.

"There may come a time when a business showing a loss ratio of four and a half per cent in good times might possibly find itself in danger.

The finance companies are now deliberately cutting rates in order to get the business.

"As a result of this competition, the automobile industry today is no longer selling automobiles—it is selling instalment contracts—it is selling pieces of paper with a lot of legal verbiage which the buyer may or may not understand and which he may or may not be able to follow out.

MR. CHENEY was until recently president of the Pacific Bank in New York. On consolidation of this bank with the American Exchange National Bank, he became vice-president of the new institution. Before becoming an active banker, Mr. Cheney served as superintendent of banking of New York State and was responsible for the preparation of most of the important laws which now govern banking in New York



O. H. Cheney

"There was a time when automobiles were sold on merits. Later, automobiles were sold on advertising 'talking points.' Now they are being sold on numerology.

"No instalment plan can be stronger than its weakest element. And the strongest plan may be weakened by excessive pressure. That is the real danger of excessive instalment selling.

"If the growth of the plan continues, more controlling measures will be necessary. The chief danger is in its being overextended—and the logical solution is for some means of really knowing whether it is going too far in any individual case.

"Present-day instalment selling was born of competition and lives and grows by competition. And who knows?—some day it may die off through competition. Those who see it and deal with it and adopt it as a business building device are mistaken—its nature is that of the strategy of bitter warfare and not of the science of building. Instalment selling of today comes not only from competitive selling but also from competitive banking—even from competitive buying: *Instalment buying is competitive living.*"

Employers Want High Wages Maintained

Speakers at manufacturing group session discuss industrial relations in the modern spirit of tolerance.

THE growing spirit of tolerance and intelligence as opposed to belligerence in approach to industrial relations problems which all close observers have noted among industrial executives in recent years was expressed clearly and unmistakably both by formal speakers and informal discussers at the group meeting of the department of manufacture.

A very definite tendency has become evident on the part of management—at least as evidenced in this representative gathering—to accept as a regular part of the industrial scheme those natural human desires for a high standard of living, personal development and advancement and individual gain which are a normal part of the make up of industrial workers as of all other human beings. Present managerial efforts are more and more attempting to

fit into the gratification of these normal desires the processes of industry and, in turn, to make the gratification of those desires adequately and efficiently serve the productive purpose of industry.

Even ten years ago the spectacle of an important business executive talking before a group of fellow business executives and winning the almost unanimous approval of that group by advocating maintenance of wages at the highest possible level and shortening of working hours insofar as possible as a means to greater profits and efficiency would have been startling if not impossible. But just this thing happened in this group meeting. And ten men were on their feet seconding the speakers' ideas to every one who echoed the sentiments of a past generation of industrial controllers.

There can be no question about the change which has come about in executive thinking and executive approach to problems of industrial relations in the last decade. This fact was visualized in striking fashion at this meeting which included executives representing practically every manufacturing and industrial interest in the country.

Uttered twenty-five years ago, the ideas which predominated at this gathering would have been met with a surprised antagonism by a large majority of men in executive control of industry. Presented in an intelligent, calm and reasoned manner today, they met with the expressed approval of a very heavy majority of the representative industrial leaders gathered together for the session.

Promoting Cooperation

Not only was the economic relation between high wages and high purchasing power pointed out, but also management was urged to tell its foremen and its employees as much as possible about its managerial and executive problems, to show the worker the relation of his specific task to the general objective of the business and to attempt to promote cooperation and greater efficiency in workers by letting them in on the fundamentals of business and management upon which the success of the organization rests.

Much of the approving discussion centered about the conclusions presented by Paul W. Litchfield, president, Goodyear Tire & Rubber Co., in his talk on "Wages—the Present Attitude of the Employer and the Employee." "It used to be thought," Mr. Litchfield pointed out, "that the first thing to cut when profits began to shrink was wages. It is now recognized that this condition should be met by increased efficiency, elimination of waste, the cutting down of overheads in production and distribution and an attempt to maintain wages by means of increased and more efficient production."

Building up the background for this thesis, Mr. Litchfield confined his discussion to practical problems of business management and proceeded on the assumption that efforts to maintain high wages are primarily for the purpose of better serving the ends of industry itself. He touched on the social and psychological aspects of the question only in relation to their effects in meeting the requirements and achieving the aims of industry.

"For many years it has been the opinion of the masses," Mr. Litchfield said, "that a man should be paid for the time he puts in. He wished to make such use of his time as he thought proper, being paid wages of a fixed amount per hour, based upon the classification under which he worked rather than upon the amount of goods which he produced."

"There has for many years been a sharp disagreement on this point.

Higher Standards of Living

"Today our standard of living is approximately thirty per cent above the pre-war standard.

"This has been to some extent due to the increased productivity of labor. The misfortunes of the people of Europe as a result of war wastes, followed by high taxation and periods of unemployment has also been a contributing factor to our relative prosperity.

"As the people of other nations get back on their feet, with their lower standards of living and lower consumption requirements, the export business which we have enjoyed and which has helped our manufacturing industries will tend to decrease. Our own markets will be invaded by foreign products, underselling those produced at home.

"This would result in decreased production and idle time and lessened purchasing power unless we can continue to offset it by still further drawing upon the powers of nature

and increasing the efficiency of production of the American working man.

"It is highly gratifying therefore to see a recognition of this by the present leaders of the American Federation of Labor as outlined at their last National Conference at Atlantic City.

"It should be the aim of our people and our government to afford equal opportunity to each man to make his time on earth productive for his own advancement.

"Wages cannot be based upon a theoretical living wage or a theoretical saving wage, but must be based upon the value of the article produced, and the standard of living must be established as a *result* of the exchange value of the wage paid, rather than being a basis of payment of those wages.

"It is naturally the desire of management to give wages as high as consistently possible; first, because steady work and high wages means increased purchasing power for the products of industry, and, secondly, because it means satisfied employees and production cannot be efficient in the presence of a general feeling of dissatisfaction."

Five fundamental principles for producing contentment, according to Mr. Litchfield, are:

1. Working conditions and task must be such as to conserve the health of the employee.
2. Employee must be so treated as to obtain his loyalty, remembering always that "the fairness of the wage received by him has more effect on his loyalty than any other factor."
3. Wage must be sufficient to keep down labor turnover and thus promote efficiency.
4. Wage must be just and fair so as to get cooperation of worker.
5. Wage should be sufficient to permit thrift and saving on part of worker.

"It is quite evident from these five reasons," Mr. Litchfield continued, "that the wage paid should be as high as possible, consistent with the success of the industry as a whole, and the ability to pay high wages is the best insurance of maintaining the kind of employees who will lower the cost of production, give better value to the consumer

THE ways of industry are changing, says Mr. Litchfield, president of the Goodyear Tire & Rubber Co. It is no longer considered good business to cut wages when profits begin to shrink. The modern executive eliminates waste, reduces overhead and increases the efficiency of his men



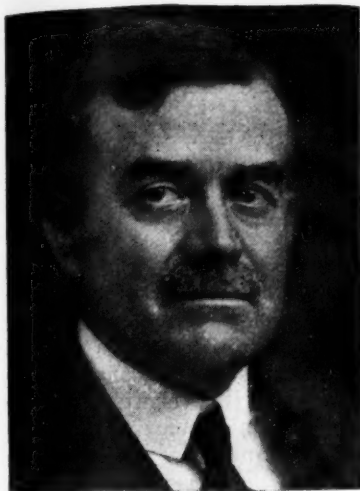
Paul W. Litchfield

and at the same time provide consumers with the means to purchase the products of industry.

"With the specialization and sub-division of labor and the harnessing of the physical powers of nature, man has become more productive. With the shortened number of hours he works at higher speed and his work is more monotonous, requiring more physical and less mental effort. It is therefore highly desirable and possible, that if this tendency increases, hours of labor of this nature can be

shortened without decreasing the real wage. This is necessary so that the worker may live a more balanced life, have extra time to devote to his mental development and for the raising and education of his family."

Representatives of the lumber, zinc and several other industries spoke in discussion of Mr. Litchfield's paper, pointing out the progress which has been made in co-



A. J. Brosseau

operative action and agreement between employers and employees in recent years.

That the view of labor and employer relations as fundamentally one of struggle rather than of possible cooperation still is thoroughly alive was evidenced, however, by expressions from a building trade representative and by one or two other executives in other fields. Some were inclined to doubt the honesty of the declaration of the American Federation of Labor in its promulgation favoring payment based on service rendered rather than of mere hours worked, feeling that the pronouncement had been made chiefly as a means of increasing membership. This opinion was a minority one, however, an overwhelming proportion of the executives present seeing it as a real recognition on the part of an important labor body of one of the principles of production for which management has been contending for many years.

The executives were urged by one speaker to show workers the relation of their particular jobs to the general objective of the company and to explain to employees in as simple language as possible the problems and activities of the organization as a whole.

A. J. Brosseau, president, Mack Trucks, Inc., who presided at this session, emphasized the fact that in talking of high wages it should be remembered that such wages must always be related to efficiency—what you get for the high wages can never be lost to view.

The productive value of foreman training, the justice and effectiveness of a policy of making promotions from within an organization and the vital need for trained men in the foreman ranks were emphasized in the paper written by Cyrus McCormick, Jr., vice-president, International Harvester Co., and read to the meeting by A. A. Jones, manager of production of the same organization.

Approaching the topic from the standpoint of the development of men, Mr. McCormick wrote that "it is obvious that management should make easy the progressive road for ambitious employees to reach the goal of real executive leadership. Foreman training involves not merely reinforcing the ability of a department head but also of instructing the future executive." His paper read in part as follows:

HIGH wages must always be related to efficiency—what the manufacturer gets for high wages should never be lost to view. That was the opinion of Mr. Brosseau, president, Mack Trucks, Inc., who presided at the manufacture group meeting

"No manager of other men can properly direct activities unless he is reasonably well instructed in the details of the work under his supervision. I very much fear that the present day insistence on mentality and intellectual strength has made all too many men feel that they can leap divinely over technical training and hard-won experience. It may be too much to say that no man can be a foreman of a foundry unless he has actually been a moulder; but it is safe to say that unless he understands the intricacies of moulding and core making and pattern work and the chemistry of iron, to say nothing of an appreciation of modern engineering and labor saving devices, he cannot be as successful a foreman as if he knows these elements of his profession. A fundamental object of foreman training, therefore, is to fortify men with experience.

The Foreman's Policy

"A company's labor policy is no sounder than the actual working policy of each of its foremen.

"The three outstanding problems of industry are maintenance of production, reduction in cost, and improvement in quality. Underlying these three and a part of each of them, is one possibly more important than any of them, and that is the development or training of man power.

"It is not quite so easy to reduce costs by means of foreman training as it is to increase quantity. That this is so is probably due to the fact that men have long since become skilled in assessing quantity, whereas an understanding of costs has hitherto been regarded as the province of the factory auditor. Reduction in cost is not merely dependent upon the provision of the best possible mechanical appliances.

"The development of men is an all-important subject that presents some extremely interesting phases. I have never seen any figures exhibiting the turnover of men in executive positions. It is, however, large, because our executive system is a very just taskmaster. It penalizes those who do not succeed very quickly and it rewards with early promotion those who have done a little more than they are required to do. There is thus a steady progression of management training foreman and foreman training understudies. No management which is oblivious to the need of furthering this progression can ever hope to succeed.

"This form of training is a continuous process of day by day and month by month perseverance and patience in thoroughly imbuing all ranks with company policy, spirit, and the like. It places a tremendous responsibility upon the executives of an organization, because they, through their personality, cannot but affect the men under them. If they are aggressive, their example will set up an aggressive spirit in their particular pyramid of activity. If they are experienced the men under them will automatically seek for experience in order to attain promotion. If they are far-sighted, their juniors will seek to discover the secret of their vision and thus qualify for the position they have held until their own promotion. The force of example is the most potent training influence.

Mystery of Promotion

"I know of no better plan of organization to accomplish these results than by focusing upon the subject the attention of all concerned. In seeking for a method to interest this foreman in thinking constructively on this score we must first remove the mystery that has surrounded promotion. Let him know that he is being examined and studied with the view of placing him, if he wins through, in a better job, and then get him to assess the men under him in the same way. In our company we seek to do this by maintaining a file of Progressive Employees.

"A training program should meet two specific problems. Firstly, where men now employed have shown outstandingly progressive qualifications, they must be given technical or general shop training, where their experience has

been limited to rudimentary schooling or restricted shop experience. Secondly, school boys or college men whose theoretical education has been full, must be qualified for executive positions by a new schooling in shop practices."

Traffic Relief Measures Are Pointed Out

Transportation session also hears discussion of motor transport as related to railway operations.

DISCUSSION and talks at the transportation group session centered chiefly around those points of difference between electric railway and automotive interests as regards coordination of facilities and vehicle regulatory measures which already have been gone over many times. Further activity along known lines of traffic relief were urged, while various representatives of local chambers of commerce were encouraged to promote in their local communities adoption of the various phases of the uniform law recommended by the recent Hoover National Conference on Street and Highway Safety.

This later admonition was made chiefly by Elliot H. Goodwin, resident vice-president, U. S. Chamber of Commerce.

Development of Aviation

It was at this meeting that Capt. E. V. Rickenbacker, vice-president, Rickenbacker Motor Car Co., stated his opinion that aviation would not really be commercialized by the present generation of business men, but that eventually it would be as large or larger than the automotive industry is today. Capt. Rickenbacker pointed out that never in the past has the generation which made possible commercial development of an idea or a mode of transportation been responsible for its major commercial exploitation. The second generation, he pointed out, is free from the rigid habits, preconceptions, and inhibitions which always characterize the older generation to some extent at any given time. Consequently, he believes, the boys and girls in school today will be responsible for much fuller commercialization of aviation facilities than the group of men already engaged in its development.

Speaking as a member of the N. A. C. C. Traffic Planning and Safety Committee, on "What the Automobile Industry Can do to Help Solve the Highway Traffic Problem," Capt. Rickenbacker said that "One of the first steps which any commercial body can take for the improvement of traffic is the extension of its street capacity without any added engineering costs. Such capacity," he stated, "can in many sections of the country be accomplished to the extent of at least 25 per cent by an examination of the volume of traffic on different thoroughfares, with regulation put into effect accordingly." Then he went on:

"When one is discussing the question of street capacity the problem of parking necessarily comes into the picture. This is necessarily a local matter. The place of the automotive trade in this situation is generally one of trying to maintain a balanced and scientific point of view.

"We do not want to advocate unlimited parking in order that the motorist may have no restrictions on his operation.

"It is probable that in time the parking question will be materially helped by the fact that our cities are tending to decentralize, through the extending of chain stores,

local theatres, suburban hotels and other facilities. There will be increasingly less need for family motor travel down town. The question is one which will probably solve itself by the law of supply and demand. As long as it is possible to park in streets without obvious inconvenience to the mass, the public will demand that right. When the volume of vehicles in any location becomes so extensive so as to make it clear that parking is a trespass on the public convenience, in such situations it will be forbidden or limited.

"The place of the automotive business and of all businesses in this situation," Capt Rickenbacker continued, "and with respect to legislation, is to make an earnest study of how the existing regulations are affecting traffic and to work with the city authorities for regulations and methods which will extend the usefulness of our streets.

"Industry and trade, are efficient in the main where this labor and invested capital are engaged in operations within the plant, but we need time studies of the conduct of our business on the street. In other words, can we afford to have local shipping done in a hit-or-miss fashion? Can we permit this investment in motor transportation to be utilized at perhaps 50 or 75 per cent of its possible efficiency? There are some companies who are aware of this situation.

"Let us always bear in mind that transportation is a part of our costs whether or not we engage in it personally.

"I venture the prediction that railroad freight terminals in the heart of the city, and the loading and unloading of vehicles at the sidewalks curb, will soon disappear.

Terminals Too Costly

"Many railroad people are pointing out that down town freight terminals are enormously costly and in many instances could very profitably be removed to the outskirts of the town, having local shipments, or trans-shipments between lines, handled by surface trucking or in some cases underground trucking. The financial relief in an improvement of this sort is enormous. Here is a problem in which every city is deeply concerned."

Talking on "Coordination of Transportation as an Aid to the Solution of the Traffic Problem," Frank R. Coates, president, American Electric Railway Association, rehearsed the electric railway view that buses are useful chiefly as feeders to electric lines, that direct competition of buses with already established rail lines should not be permitted, that passenger car and truck parking should be forbidden on streets where any traffic congestion exists, particularly where electric lines are operating, and that segregation of traffic handling mass transportation from that carrying individuals may be necessary.

Mr. Coates said in part: "I want to urge the adoption by all communities of the recommendations made by the



Capt. E. V. Rickenbacker

CAPT. RICKENBACKER read a paper on what the automobile industry can do to help solve the traffic problem, and incidentally declared his belief that the present generation of business men would not succeed in commercializing aviation

Committee on Metropolitan Facilities of the National Conference on Street and Highway Safety, especially the recommendation that each community form a voluntary civic committee to study the traffic problem, and looking to the future, to provide a transportation plan that will take care of the increase in traffic as it comes about.

"I believe that such a cooperative effort to solve the local traffic problems can not fail to produce good results.

"One of the commonest causes of traffic congestion is the parked vehicle, and this is most serious in its effect on street car movement. I do not think anyone will question my statement that the primary purpose of a business street is the movement of traffic. When communities permit automobilists to park their cars along both curbs of business streets, they narrow the street from twelve to fourteen feet, they blockade the doors of the merchants, they impede all traffic, they create a serious accident hazard, and they endanger or inconvenience the millions who go and come in the street cars. In addition to all that, they interfere with the movement of fire apparatus, and they turn the public streets into storage places for private property.

"I may be accused of special pleading when I make this statement, but let me remind you again that we street railway men must regard ourselves as the representatives of the masses of the people and when I make a plea for easier movement of street railway cars through the city

streets, I am pleading for the vast majority of the population of this country.

"There is no question in my mind but that there is a tremendous waste of street space by competing services in not a few communities. To illustrate: Steam railroads for many years have furnished adequate transportation facilities between communities. Interurban and suburban electric railways have been giving at-your-door transportation service in the territory where station service has been given by the steam roads. The services have supplemented each other. Some years ago there developed the jitney, which competed with the interurban electric railways and the city railways, and now there comes the interstate bus, immune as yet from public regulation, competing with both the steam and electric railways. The wastefulness of this duplicative transportation has been evident to all who give the matter a thought, and it has been costly to the railways and the public, as well as the promoters of some of the competing bus lines.

Should be No Duplication

"The steam and electric railways of the United States believe that they are charged with the responsibility of providing complete transportation service. The public, through the enactment of laws creating the Interstate Commerce Commission and the Public Utilities Commissions in the various states, to regulate common carriers, have recognized the responsibility of the established transportation companies. Through these commissions, the rates of fare, the freight rates, the frequency of service and even the dimensions and character of the vehicles used are regulated and decreed. The earnings of the railroads are limited by law and repeated decisions of the Supreme Court of the United States have declared that a fair return to a public service company is 8 per cent. In view of the public interest in the railways, as evinced through the regulatory measures that have been enacted into law, and in view of the public's recognition of the essentiality of rail transportation service, there can be no justification of a duplicate service that deprives the regulated rail lines of a fair return and which, more important than that, deprives the public of the high grade of service to which it is entitled.

"By all the rules of logic and by all the elements of justice, mass transportation service should be supplied the public by the rail lines. Competition by jitneys, whether they are competing with a city railway or interstate highway vehicles competing with a steam railroad, cannot be justified, because it is wasteful, and damaging to the public interest."

Self-Regulation of Business is Urged

Best way to eliminate necessity for Government interference, speakers declare. Suggest same policy for farmers.

LED by Herbert Hoover, the business leaders gathered in Washington for the Chamber meeting emphasized and reiterated the idea that the way to keep Government regulation out of business is for business to so regulate itself as to eliminate the necessity for governmental interference in its processes.

The growing realization of the necessity for self-regulation by business was made clear in the expressions of John W. O'Leary, president of the U. S. Chamber of Commerce; Julius H. Barnes, The Barnes-Ames Co.;

Royal W. France, president, Salt's Textile Co.; Julius Klein, director, Bureau of Foreign and Domestic Commerce, and many others.

Pointing to the wave of sentiment for business regulation which swept the country a few years ago and reviewing the events since the formation of the U. S. Chamber of Commerce in relation to this wave, for example, Mr. O'Leary said: "Through the years which have passed since the first call to business men by President Taft a new spirit has developed; a spirit of desire

on the part of business men and business organizations to frown on bad practices and stand for right practices; a spirit of willingness to give thought and helpful information to those responsible for government; a spirit of willingness to enter into the community, state and national life."

Agriculture, as well as business, Mr. O'Leary believes, can best work out its destiny "through the policy of self-government and not, as some would have us believe, through paternal control by the Federal Government."

Further views of a similar character were embodied in the statement by Julius Barnes that, while organized business does not claim that its practices in the past

were always fair and just, "both Government and business today in the main strive to be honest in conduct, intelligent in understanding and sympathetic in cooperation. Self-government, whether in industry or in politics, can be lasting only if it achieves the support of public confidence."

"Organized business believes," Mr. Barnes said also, "that progress in rightful industry is served not by rigid Government regulation, but by enlightened ideals, guiding the practical experience which removes defects and abuses and develop, without the injury of rigid bureaucracy, a larger measure of service to society along with its own rightful earnings."

Declarations of Interest to Automotive Industry

WHILE some twenty-nine declarations were officially passed by the U. S. Chamber of Commerce at the recent meeting only seven or eight had any direct bearing on the specific interest of the automotive industry. Part of the text of the declarations falling in this latter group follows:

Compulsory Automobile Insurance

To reduce traffic accidents, compulsory insurance has in some quarters been advocated for the owner of each automobile. A careful study of these proposals fails to disclose reasons to believe that, if adopted, they will reduce accidents.

For that reason, and for other reasons appearing in the report before this meeting, we oppose the principles of compulsory automobile insurance and advocate efforts which are calculated to increase the safety of our streets and our highways for all users.

Commercial Aeronautics

Civil Aeronautics in the United States should be given full opportunity for growth through commercial development, with reasonable regulation and active promotion by the Federal Government and separately from the military and naval aeronautical services. The Chamber heartily endorses the pending legislation for this purpose and urges upon Congress its enactment into law at this session. In view of the predominant interstate and international character of aeronautics its regulation should be by Federal and not by State authority, and suitable international agreements should be reached with foreign countries.

Cooperation of the aeronautical industry and the insurance companies with the government authorities is urged in order to develop and perfect an adequate system of statistics regarding the performance of this industry both as a basis for its economic development and to permit establishment of the necessary insurance service and rates on a basis favorable to the growth of the aeronautical industry.

The importance of providing proper landing fields is urged upon the authorities of communities located upon natural air routes with traffic in prospect, and cooperation among communities interested is urged to provide immediate emergency landing fields essential to safety of flight.

The provision by Congress of adequate funds to carry on an adequate program of aerial light-houses and other aids to air navigation is recommended.

The practicability of air transport has been demonstrated. Its commercial success is dependent upon volume of business. Simplification of Air Mail rates is desirable to assure widespread patronage. All classes of business men are urged to make the fullest practicable use of this service. Commercial organizations are urged promptly to develop a sound program for the development of air mail and commercial traffic. The appointment of local committees by such organizations is recommended and the National Chamber now stands ready to cooperate to the end that this work go on without delay.

International Highway Conferences

The great development of modern highways in the United States has focused attention upon the benefits which adequate highway systems can bring to all countries. Living standards are raised, increased means of communication lessen misunderstandings, and international trade is fostered.

We therefore look with favor upon all sound proposals for international conferences on the subject of improved highways and ask that all possible steps be taken to facilitate through such conferences the exchange of knowledge respecting all phases of highway development.

Taxation

We request that Congress, in making appropriations, keep clearly in mind the imperative necessity of a substantial reduction in the present corporation tax.

Preparation of Shipments

In view of the great waste that has occurred through indifference or carelessness in the packing of goods by manufacturers and distributors for shipment by common carriers, this Chamber in conformity with its expressed policy to discourage practices that lead to extravagance or waste recommends to its membership the adoption of any and all measures that will induce shippers to take a more active interest in the preparation of their goods for shipment and thereby assist in reducing loss and damage in such transportation.

Governor Albert C. Ritchie, of Maryland sounded a similar note when he urged that we "put business in government to the fullest extent possible, but take government out of business except where the great heritage of equality of opportunity necessitates its presence. This great, delicate human mechanism we call business," he continued, "should be as free as possible from governmental interference, so long as it does not abuse that freedom. If you complain of too much government in business, give the Government no need to regulate what you should regulate yourselves."

"I am not arguing for freedom of business simply to spare it annoyance," Governor Ritchie added, "but only because I think business unhampered is a better instrumentality than Government, not only to work out its own salvation, but also to work out the impending social and economic problems."

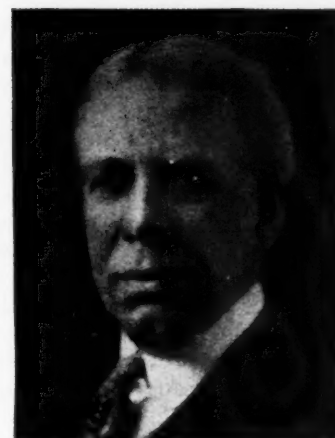
Domestic and Foreign Angles

The question of self-government in business was approached both from the domestic and foreign angles. Discussing the former, Royal W. France said that the greatest difficulty we have to overcome in domestic trade relations is not dishonesty, but "lack of understanding of the problem of the man on the other side of the fence." He pointed out that "it is in the matter of bringing about an understanding of why abuses arise that the committee on trade relationships of the National Distribution Conference of the U. S. Chamber of Commerce can render its most effective service."

As regards foreign trade aspects of the case, Julius Klein came to the conclusion that "certainly the experience of the past few months has well proved the axiom that 'self-regulation in business' is pre-eminently sound in international business and that any departure from that rule, especially in the direction of governmental price-fixing, it bound to result in defensive measures by consumer nations which may dislocate the entire trade and may, indeed, breed international ill-will through the most unfortunate retaliatory devices."

The general progress of twenty-five years which has come to this country, in which business has to a large extent been self-regulatory, were described by Herbert Hoover. The social and economic currents which have been developing in American business in the last quarter of a century Mr. Hoover said are:

MR. HAYNES, until recently president and now chairman of the board of Dodge Brothers, Inc., was re-elected to the directorate of the Chamber of Commerce of the United States at the annual meeting last week in Washington, D. C.



F. J. Haynes

"1. A changing attitude on the part of employers toward labor and wage questions, the very essence of our present great production being high wages and low prices.

"2. A changing attitude on the part of labor toward questions of production efficiency.

"3. Growth of conscious cooperation in the business world.

"4. Growth of larger and larger units of production and distribution.

"5. An increasing stability of credit.

"6. A large cumulative value from intensified education.

Increase in Efficiency

"I may conclude," Mr. Hoover said in summarizing, "that over a quarter of a century the sum of those underlying forces which I have mentioned—and others as well—has been at least a great increase in our national efficiency.

"Some feel that in all this we are deadening the soul of men by machine production and standardization. I haven't time to go into this question, but I may observe that the man who has a standard automobile, a standard telephone, a standard bathtub, a standard electric light, a standard radio and 1½ hours less average daily labor is more of a man and has a fuller life and more individuality than he has without them."

Era of Greater Farm Prosperity Ahead

U. S. Chamber of Commerce speakers say prospects for better conditions in agricultural sections are good.

PROSPECTS for betterment in the agricultural situation are bright, although present conditions are not especially good, particularly in the corn belt, according to the speakers at the Chamber meeting who discussed farm problems and remedies. Stating that "it needs no argument to establish the fact that for six years we have been under the shadow of the worst panic agriculture ever experienced," Jared Van Wagenen, Jr., went on to say:

"The farmer just now may be down but he is on his way up. Certain facts stand forth concerning which there is no disagreement. Our population increases more than one-half million each year. Our agricultural acreage is either stationary or declining. Our farm population constantly

diminishes. Our crop yields are slowly dropping down. The stage is all set for a sudden change of scene. And when it does come it will be the farmers' day and time and the law of supply and demand will bring what legislation never can—the correction of economic inequalities."

A somewhat similar picture, drawn from specific conditions in the corn belt was presented in the talk given by F. L. Garlock, assistant professor of agricultural economics, University of Iowa, who said:

"The situation in the corn belt is characterized by relatively low incomes as compared with 1919, relatively high indebtedness and high taxes which hold expenses at a high level, inability to help matters by voluntary con-

traction, depressed land values and a high degree of farmer insolvency."

But Mr. Garlock held out six hopes for better future conditions, as follows:

"First, world population will continue to grow, increasing needs and consequently demand for agricultural products, with the result the agricultural prices will rise.

"Second, improved standardization and greater popularization of corn-belt products hold out bright promises for the future.

"Third, there is a possibility that greater industries will be attracted to the mid-west, thus increasing local markets for corn-belt products.

"Fourth, reduction or abolition of protective duties would undoubtedly lower many items of expense to the corn-belt farmer.

"Fifth, the possibility exists that additional governmental aid may be given to agriculture.

"Sixth, as an alternative to all suggested means of legislative relief, the corn-belt farmer may have to work out of the present situation by making such internal adjustments as are possible."

That automobile purchases should continue steady in rural sections and that the farmer isn't going to lower his standard of living, however, was definitely indicated by Mr. Van Wagenen when he said:

"There is another criticism of the farmer which I cannot take good-naturedly. It is to the effect that the matter with the farmer is that he spends too much time burn-gasoline on the highway.

"Now I am inclined to agree that we as a nation are too extravagant in many things but I resent being singled out as a class and ordered to do the economizing for all the rest of the country.

"Nowhere in law or equity is it written that the farmer shall accept a different standard of living or a lower ideal of culture than the rest of the world."

Automotive Exports Second

ADDITIONAL evidence of the influence of the automotive industry upon the commercial and industrial life of the nation is contained in a booklet entitled "Our World Trade in 1925," published recently by the Foreign

Commerce Department, Chamber of Commerce of the United States.

Exports during 1925 of only one commodity—unmanufactured cotton—were greater in value than exports of automobiles, parts and accessories (except tires and engines), and third in the order of importance was gasoline, naphtha and other light products of distillation—products closely related to the automotive industry.

When to these two classes of automotive products are added exports of gas and fuel oil, automobile tires and automobile engines, the total value of exports of automotive and related products becomes \$589,258,000, or over 12.2 per cent of the total exports from the United States during 1925.

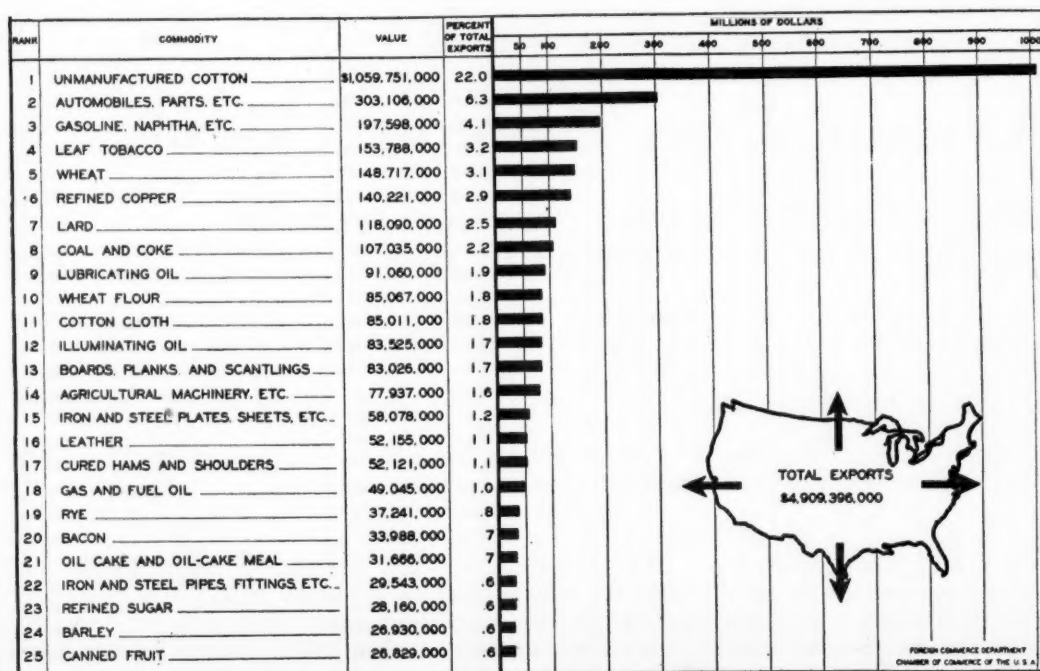
In imports the automotive industry holds an equally important place. During 1925 imports of crude rubber and latex ranked first in value and, in combination with imports of crude petroleum, constituted 12 per cent in value of total imports for the year.

Comparisons of quantities exported and imported give an equally favorable picture but cannot be so readily classified. Gas and fuel oil and gasoline, naphtha and similar products ranked second and third, respectively, in quantity exported in terms of weight while the item of automobile parts and accessories was well up in the list. With over 300,000 cars and trucks and in excess of 1,500,000 tires added to these, total quantities of automotive products exported was a very important item in the foreign trade of the country.

Direct automotive products do not figure so much in imports but crude petroleum led all other commodities in quantity imported while light distillation products and crude rubber were in fourteenth and seventeenth places, respectively.

These figures tend to bear out the statements which have been made by several economists that the present prosperity of this country is based largely upon the prosperity of the automotive industry and the building trades.

EXPERIMENTS have been carried out for some time by the New Zealand Government Railways Department with various types of self-propelled coaches. Petrol-electric, plain petrol and steam cars have been tried. Now a coach is being equipped with a hot-bulb engine and Föttinger hydraulic transmission gear.



Exports from U. S. During 1925

THE accompanying table, prepared by the Foreign Commerce Department, shows the value of different commodities exported from the United States during 1925. It will be seen that automobiles and parts rank second, constituting 6.3 per cent of the total, but if other products closely related to the automotive industry, such as engines, tires, gas and fuel oil, etc., are included the percentage is swelled to 12.2

New "60" Embodies General Features of Other Chrysler Sixes

Has 180 cu. in. engine with 21.6 rated hp. Top road speed exceeds 60 m.p.h. A new Ross steering gear and cylindrical type Pur-O-lator used. Master brake cylinder in new location.

WITH the introduction of the new "60" line, preliminary announcement of which was made in our news columns several weeks ago, the Chrysler Corp. makes its entry into the \$1000 light six-cylinder field and gives its dealers a range of three six-cylinder cars and a medium-price four.

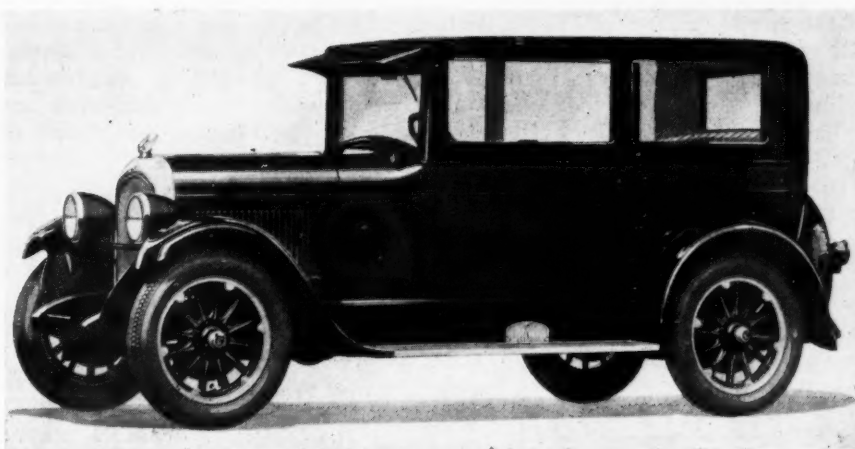
According to Walter P. Chrysler the manufacture of four-cylinder cars will be continued.

Neither the chassis nor body designs of the "60" models show any departure in general from previous Chrysler six-cylinder cars and such features as seven bearing crankshaft; vibration dampener; manifold heat control; hydraulic four-wheel brakes and low hung, compact bodies are retained. Except for body colors, the general appearance of the "60" and the original "70" cars is much the same.

Five body styles, which include a touring at \$1075; roadster \$1145; coupe \$1165; coach \$1195 and a sedan at \$1295, are offered on the "60" chassis. The chassis lists at \$915. Both open models and the coupe are trimmed in Spanish leather and the two 5-passenger closed cars in corduroy. When desired the sedan and coach can be supplied in Spanish leather at an additional cost of \$35 and \$30 respectively. Exterior finish on all models is in Duco of special blue shades, except the coach which is finished in gray. Two-piece windshields are used on the open cars with the "VV" one-piece windshields on the Fisher closed bodies. Bullet type headlights and cowl lights to match, with nickel-plated rims, are used on all models except the open cars, which have parking lights on the side of the bodies instead of the cowl lights.

A wide performance range is claimed for the "60" which is powered with an L-head engine of 3 by 4 1/4 in. bore and stroke, which gives an N.A.C.C. rating of 21.6 hp., a piston displacement of 180.2 cu. in. and at 3000 r.p.m. develops 54 brake hp. The smaller engine possesses the same qualities of smoothness and flexibility found in the "70" powerplant and unusual fuel economy is claimed—under normal touring conditions 22 miles to the gallon. A speed of 63 m.p.h. and acceleration of 5 to 25 miles per hour in 7 3/4 seconds are claimed.

Block and crankcase are cast integral, the oil pan is of pressed steel and the semi-machined cylinder head detachable. The crankshaft, balanced statically and dynamically, is mounted in seven bronze-backed, babbitt-lined bearings. These are of the interchangeable type



The two-door coach on the new Chrysler "60" chassis, listing at \$1195. Finished in Killarney grey Duco with brown corduroy upholstery

which do not require any fitting work when replaced.

The connecting rod bearings are cast integral with the rod by a centrifugal process and the rods are interchangeable. No shims are used at either the main or crankshaft bearings.

On the forward end of the crankshaft a Lanchester vibration dampener is mounted just in front of the fan-water pump drive pulley on the rear main bearing. Dimensions of the main journals are: Diameter 1 7/8 in. throughout; lengths, front 1 7/8 in.; center 1 9/16 in.; rear 2 13/16 in.; intermediate journals 1 in. long. The weight of the shaft is 39 lb.

Drive to the four-bearing camshaft is through a Morse 1 1/4 in. wide chain forming a conventional triangular drive with the generator. Beneath the crankshaft sprocket a metal bridge is attached to the case so that when the chain is removed from the generator sprocket the chain cannot fall out of mesh with the crankshaft sprocket and cause a difference in valve timing. Dimensions of the camshaft bearings, which are machined in the case except the bronze-backed babbitt-lined front bearings, are:

	Length	Diameter in.
Rear	1 5/32	1 3/8
Rear center	11/16	2
Front center	11/16	2 1/32
Front	1 1/2	2 1/4

Between cylinders 3 and 4 the skew gear formed integral with the shaft furnishes the drive for the vertical shaft operating the ignition distributor and the oil pump.

The camshaft is rifle drilled to provide positive lubri-

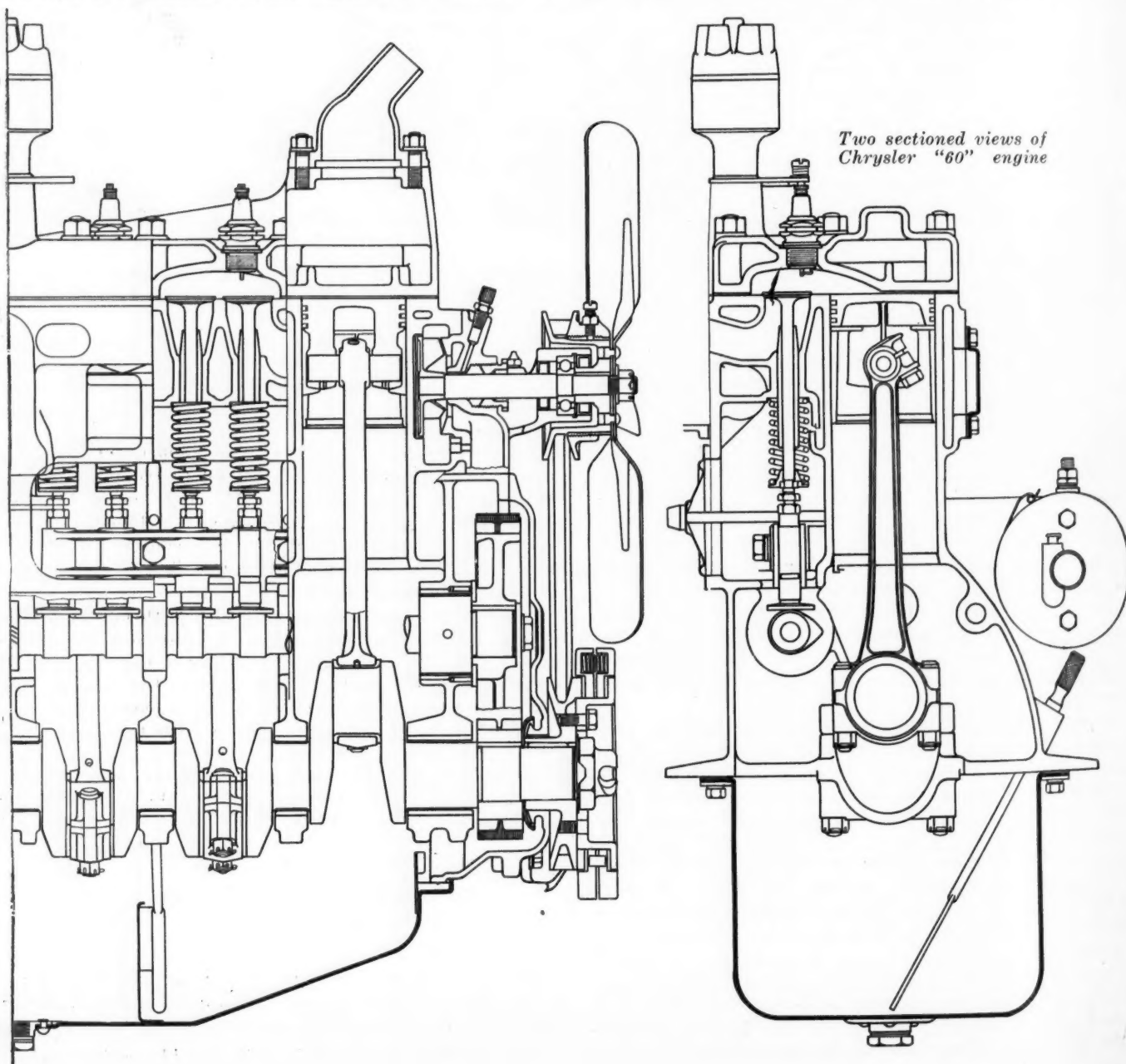
cation for the bearings, oil being fed directly from the pump to the shaft. Adjustment to compensate for wear in the timing chain is provided by swinging the generator about the lower bolt in the customary manner.

Lynite pistons of special slotted skirt design and open between the head and skirt are of the same type as those employed on the "70." The length of the piston is 3 11/16 in. with the distance from the center of the pin to top of head 2 in. and the fitting held to within .002 in. clearance. Three gray iron rings of 1/8 in. width all located above the pin are used, the lowest ring being of an oil control type necessitating relief holes drilled in the groove. The piston pins are clamped in the connecting rods with their outer ends bearing directly in the pistons. They are formed of alloy steel and lapped finished to .0002 in., their dimensions being 3/4 in. by 2 11/16 in. long. Conventional I section rods are employed having a 9 1/2 center to center length, weighing 1.92 lb., with their dimensions at the lower end being 1 7/8 in. diameter by 1 3/8 in. long. All rod assemblies are matched to within 16/100 of an ounce and withdrawn through the bottom of the cylinders.

Valves are mounted on the right side of the block,

the inlet valves being formed of chrome-nickel steel with the exhausts of chrome-silicon steel. Their clear diameters are 1.5/16 in. with a 5/16 in. lift. The mushroom type two-piece tappets are mounted in two groups of six in detachable brackets with the valve stem guides removable. Manifold design is the same as employed on the "70" and "80" and incorporates the manual heat control. A Stromberg plain tube carburetor provided with simplified adjustments for differences in temperature is equipped with a Handy centrifugal type air cleaner. Fuel is delivered to the engine by a Stewart vacuum tank from an 11-gallon tank of Terne rust-proof steel at the rear. Remy ignition, generator and starter electrical units are employed in conjunction with a Willard 6-volt, 90 amp. hr. battery. The starter secured to the bell housing by a single screw engages with the teeth cut in the balanced flywheel by an inboard Bendix drive. The ignition distributor carried on the top of the cylinder block is provided with a semi-automatic advance and a single breaker.

Engine lubrication is of the force feed type with oil delivered under pressure to the crankshaft, camshaft and front end drive through drilled passages in the



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crankcase. At a predetermined point, the lower end of the connecting rod is drilled so that a jet of oil is delivered to the cylinder walls. Other parts are lubricated by mist. Oil is taken into the gear pump located in the oil pan through a bell-shaped screen of large dimensions which can be seen in the cross section drawings of the engine. A new cylindrical type Pur-O-lator oil filter is bolted to the dash and is fed from a special lead on the engine enabling an amount of oil equivalent to the contents of the crankcase to pass through the filter approximately every 25 miles of normal driving. Under these conditions the oil pressure from the pump is from 25 to 30 lb., while the oil capacity of the crankcase is $1\frac{1}{2}$ gal.

Water cooling is by a fin and vertical tube type of radiator. A four-bladed fan is carried on the same shaft as the water pump impeller and secured to the front of the cylinder block. Drive of this combined fan and pump unit is through a V belt, adjustment for belt wear being provided for by a movable flange on the fan pulley. Particular care has been exercised to insure uniform cooling of the cylinders and valves, each of these being completely water jacketed. Cover plates bolted to the left side of the block enable the water passages to be cleaned and inspected.

Engine, clutch and transmission are formed in unit and supported in the frame at four points. Between the clutch housing and the flywheel housing a heavy gauge steel plate is inserted which encircles the housing and forms the means of supporting the rear of the power-plant.

Clutch Weight Reduced

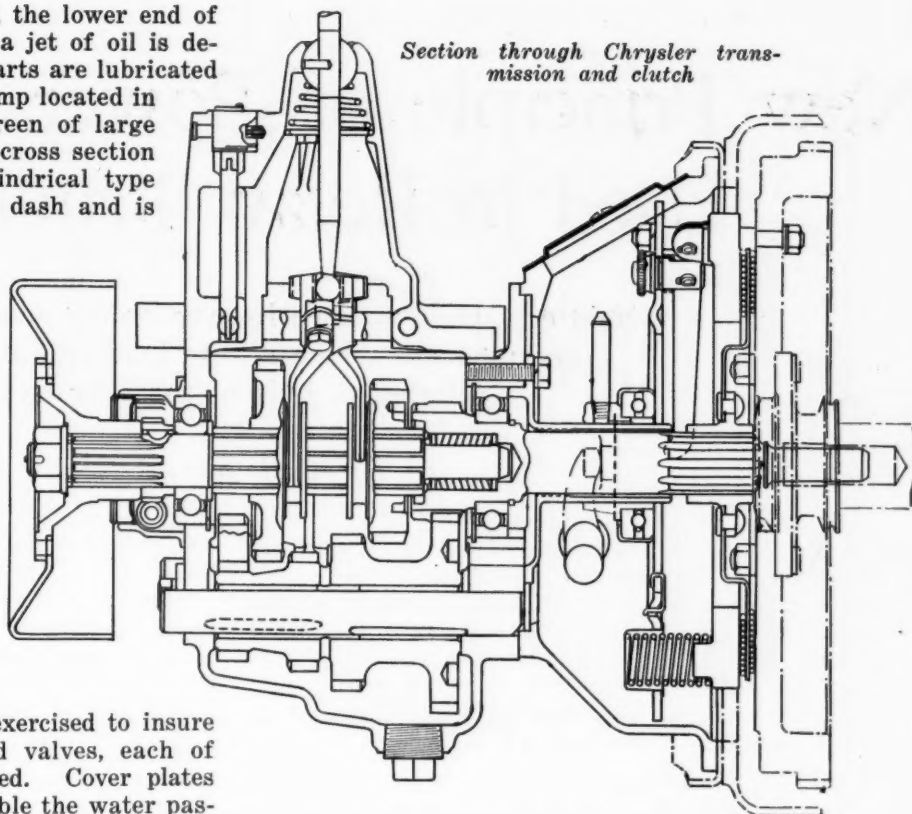
A single dry plate clutch balanced in the same manner as the flywheel and of the same type as employed on the other Chrysler cars is adopted. The weight of this unit has been reduced to a minimum through the use of a thin spring steel plate having the friction facing woven directly into it, forming an integral unit. The transmission case differs from the "70" layout inasmuch as it is demountable from the clutch housing. An approved lock is built into the case. Immediately behind the transmission the emergency brake drum of 8 in. diameter by $2\frac{3}{8}$ in. wide is carried on an extension of the main shaft.

Two Spicer universal joints and a 2 in. diameter propeller shaft are employed to transmit the power to the rear axle. The semi-floating rear axle, with a pressed steel housing of $\frac{3}{16}$ in. stock, is designed for the Hotchkiss type of drive. Drive gear and pinion are of nickel chrome-vanadium steel with the face of the gears $1\frac{1}{8}$ in. wide and providing a 4.7 to 1 ratio for the open models and a 4.9 to 1 reduction for the closed cars.

A conventional I section front axle is used instead of the tubular axles which feature the two larger cars. Two Shafer roller bearings are provided for each wheel and ball thrust bearings at the knuckle heads. The king pins of $\frac{11}{16}$ in. diameter are inclined at a noticeable angle to provide pivotal steering. A Ross semi-reversible cam and lever steering gear of new design and improvements in the drag link assembly enable the wheels to be turned without additional effort regardless of the angularity of the front wheels.

While the four-wheel service brakes of the Lockheed hydraulic type are the same design as employed on other Chrysler cars, the location of the master cylinder is new.

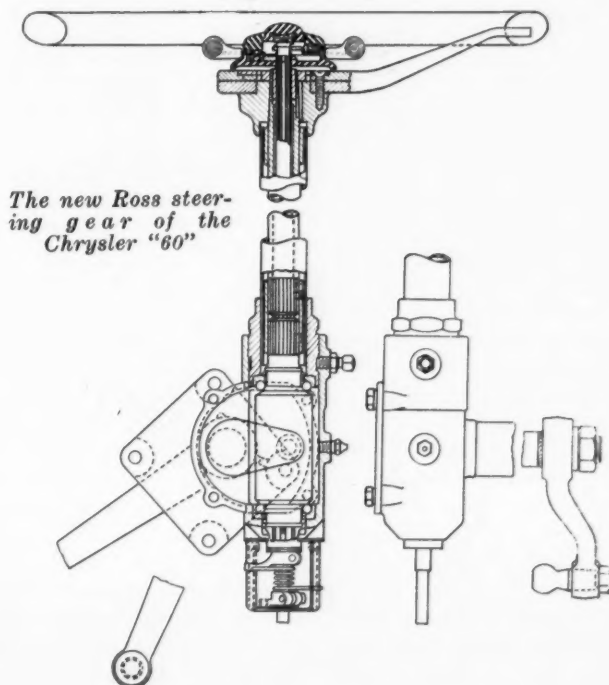
Section through Chrysler transmission and clutch



Instead of being mounted on the transmission case, the master cylinder is attached to the flywheel housing in line with the brake pedal. All four drums are 14 in. diameter with the band $1\frac{1}{2}$ in. wide and of the contracting type. The surfaces of the drums are machined concentric with their center mounting, making it impossible for the brakes to surge.

Chassis lubrication is by the Zerk pressure gun system.

Artillery-type wood wheels with 30 by 5.25 in. four-ply balloon tires are mounted on demountable rims, the entire unit being balance before mounting on the car. The wheelbase of the "60" is 109 and the overall length 156 in.



The new Ross steering gear of the Chrysler "60"

New Principle of Power Transmission Used in Relay Truck Drive

Weight of vehicle utilized in overcoming road obstacles by arrangement which allows load to move with relation to axis of the rear axle.

By Leslie S. Gillette

IN a 3½-ton truck manufactured by the Commerce Motor Truck Co., Ypsilanti, Mich., use is made of a new principle of power transmission in what is known as a relay axle for the final drive, whereby the performance of the truck is said to be greatly improved and its field of usefulness extended.

The major part of the weight of the truck can move with relation to the axis of the rear axle, and when power is applied to the axle by the engine this weight is moved in such a way that it helps to maintain the momentum of the truck while under way and also assists in starting and in overcoming obstacles. Additional traction on soft ground is also claimed for the new construction.

It is estimated that in quantity production Relay Drive trucks can be manufactured at the same cost as trucks fitted with the usual form of axle. At the present time 48 Relay Drive 3½-ton trucks are being built and it is planned to incorporate these axles also in other Commerce trucks ranging in size from 1 ton to 5 tons. In addition, the new axles will be employed on buses and tractors, while the design is applicable also for installation in passenger cars.

Originally the axle was developed by P. B. Newkirk, an inventor of Seattle, Wash., and the Krikwen Multipower Axle Co. was formed to manufacture and exploit it. In 1924 a syndicate was formed to take over the patents on the Krikwen axles, and later, in 1925, the same syndicate took over control of the Commerce Motor Truck Co. in order that the axle and truck designs could be coordinated. Up to the time of going into production over 10 Relay Drive trucks had been built, and several models have been undergoing tests in various parts of the country for two years. A. C. Hamilton and Frank M. Kincaid are re-

sponsible for the present development of the axle and truck.

The general principle of the axle may be described briefly as follows: By a gearing arrangement in the rear wheels, which forms a part of the driving system, and a flexible connection between the axle and frame, when engine power is applied the chassis is moved forward and upward several inches before the wheels start to roll,

which occurs when the moment of the weight lifted over-balances the moment of the traction resistance. When an obstacle, hole or soft ground, is encountered, the weight of the truck is lifted further, whereby the moment of the weight is increased, and this increased moment assists the engine in overcoming the resistance. It is asserted that, since the weight moves forward and upward before the

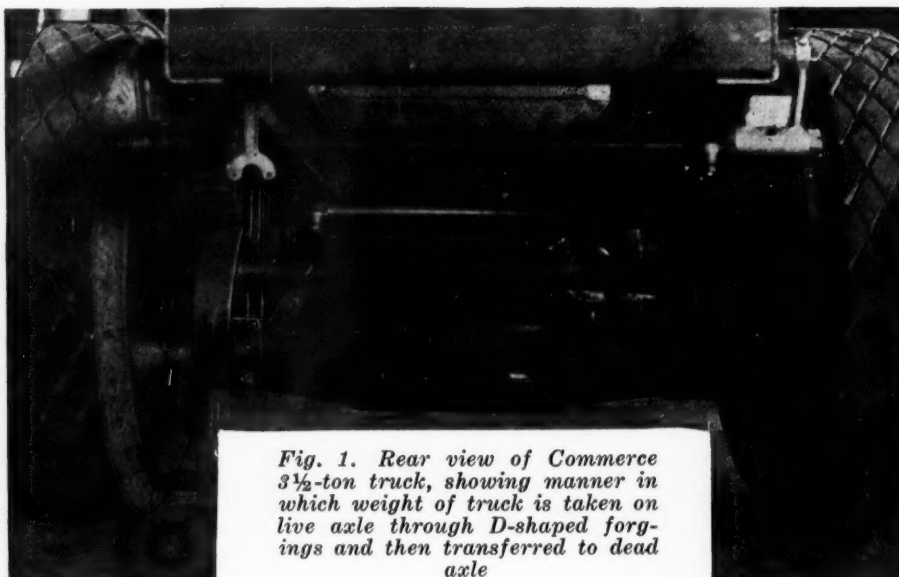


Fig. 1. Rear view of Commerce 3½-ton truck, showing manner in which weight of truck is taken on live axle through D-shaped forgings and then transferred to dead axle

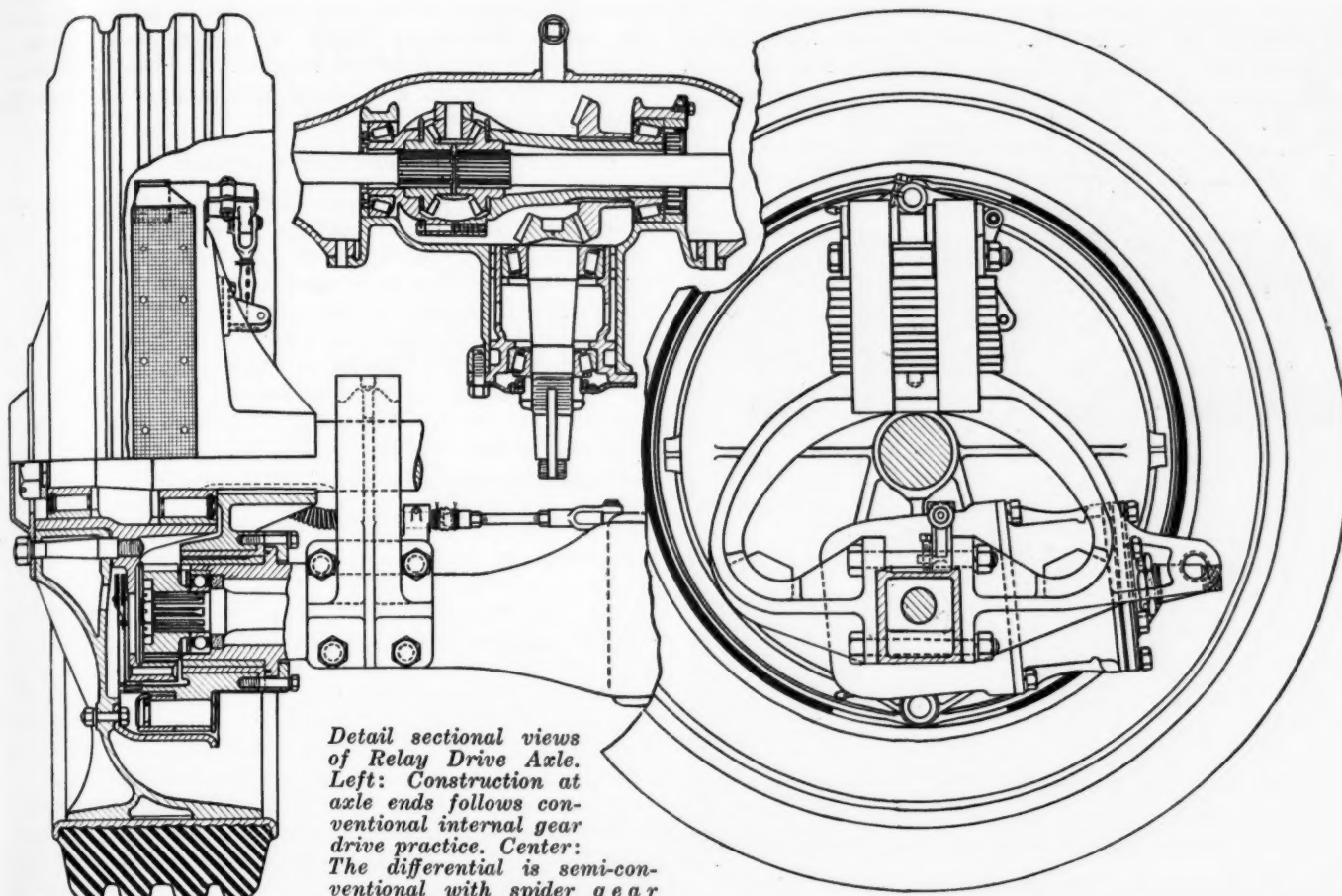
rear wheels begin to rotate, the wheels have better traction, because the initial momentum assists the wheel traction.

In the Relay Drive axles there are three major parts. These are the dead axle which carries the wheels, the live axle which is driven from the propeller shaft in the customary manner, and, finally, the internal gear and pinion which transmit the power to the wheels.

As can be seen from Fig. 1, the rear springs are connected with the lower or live axle housing by special design D-shaped forgings. These forgings, together with two radius rods, tie the live axle housing to the chassis. The ends of the dead axle are keyed to the centers of two circular-shaped castings, and at 7 in. from the centers of these castings bosses are provided to enable the castings with the dead axle to swing on bronze bushings around the live axle housing.

It will be seen that when the truck is at rest the pressure due to the weight of the chassis and load is trans-

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Detail sectional views of Relay Drive Axle. Left: Construction at axle ends follows conventional internal gear drive practice. Center: The differential is semi-conventional with spider gear housing located well to the right of pinion. Right: The compensating action is secured through movement of the D-shaped forgings about the dead axle

mitted through the rear springs to the live axle housing by the D-shaped forgings. As the circular castings are carried in the dead axle and the former support the live axle housing, it will be noted that the total weight is transferred to the dead axle and then to the wheels. Provision is made to allow the live axle to swing 60 deg. on either side of the central point established when the truck is at rest. As the live axle is connected directly with the chassis frame, when power is applied, the truck will move in conformity with the movement of the live axle.

The axles are provided with the usual form of differential in the live axle housing and the live axles are driven through the usual spiral bevel gearing from the propeller shaft.

Fig. 2 shows the driving pinion mounted on the end of the live axle shaft, and the bushings carrying the circular casting, together with the dead axle, will be seen immediately behind the pinion. In this picture the live axle is shown in one of its extreme positions. When the truck is at rest, the dead axle center is immediately above the axis of the pinion, and these two are directly over the point of tire contact on the ground. On the inside of each wheel is secured a drum with an internal gear meshing with the pinion. Fig. 3, (following page), shows the position of the axles when the truck is stationary.

In climbing the circular track the pinions can move the truck forward or backward $6\frac{1}{4}$ in. and at the same time the entire load or rear of the truck is raised $3\frac{5}{8}$ in. During the total horizontal movement of $12\frac{1}{2}$ in. and the $3\frac{5}{8}$ in. vertical travel, the rear wheels remain stationary of their own accord. From the accompanying pictures it will be seen that there is not an excessive amount of clearance between the live axle housing and the ground. How-

ever, the action of the pinions in turning the wheels, especially when an obstacle is encountered, lifts the axle housing and provides an unusual degree of clearance.

As road conditions change due to uneven surfaces and grades, the pinions adjust themselves to follow every irregularity and automatically deliver the turning effort to

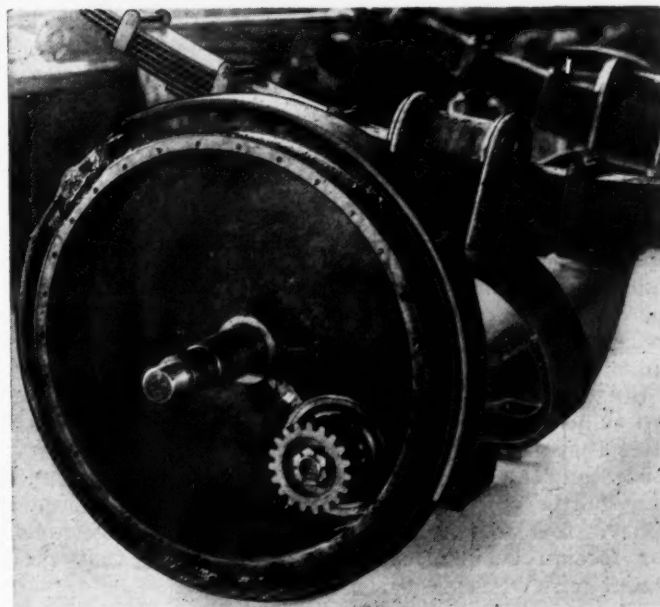


Fig. 2. This view shows the wheel removed exposing the track pinion and the dead axle shaft. When the truck is at rest the dead axle center is immediately above the axis of the track pinion. The bushings on which the live axle swings can be seen behind the pinion. The track gear is riveted to the hub of the wheel

the rear wheels proportionate to the requirements. It must be understood that the Relay Drive enables energy to be stored between the peaks of road resistance, which accounts for the weight assisting the truck during peak periods.

The action may be summarized briefly as follows: The pinions continue climbing the circular track until they

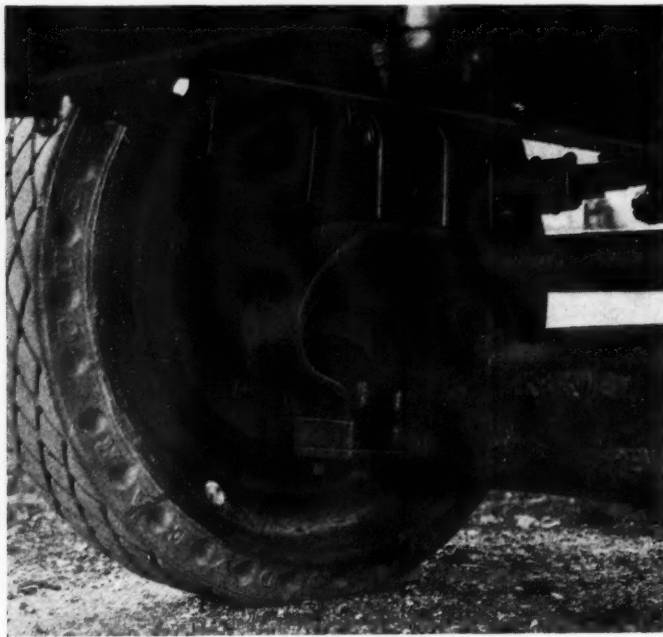


Fig. 3. Another view, showing the D-shaped forging which connects the chassis with the live axle. As the power is applied when an obstruction is encountered the live axle rises increasing the ground clearance

have taken a part of the load sufficient in amount to cause the wheels to rotate. While the engine is delivering a constant torque to raise the weight of the load, the weight is constantly acting downward in a manner to cause the rear wheels to rotate.

Engine Power Constant

Although additional power is required to overcome the road resistance when an obstacle is encountered the power delivered by the engine is kept constant. The amount of extra effort required to surmount the obstruction is automatically determined by the size of the obstacle. When an object is encountered the wheels slow down, but due to the momentum of the truck the chassis moves upward and forward through the pinions automatically following up the circular track. When the weight on the pinions is sufficient to cause a state of overbalance the wheels move forward and climb over the obstruction. Finally, in overcoming road resistance, the Relay Drive uses the power of the engine directly and it also draws upon the momentum of the truck and the store of potential energy due to the raised position. These latter two sources of energy are, of course, constantly restored by the engine.

Track gears and pinions are of $4\frac{1}{2}$ to 6 pitch with the face of the gears $1\frac{5}{8}$ in. The pitch diameter of the larger gear is $18\frac{5}{8}$ in., with the track pinion $4\frac{1}{4}$ in. The former is riveted to the hub of the wheel and is made of 2320 S.A.E. steel, while the smaller gear is of 2315 S.A.E. steel. Including the spiral bevel drive to the live axles there is a total gear reduction of 9.28 to 1. The pinion and track gears are so designed that two teeth are always in mesh. Two quarts of lubricant is carried in the gear compartment of each wheel. Service brakes are of the double acting external type, on 6 in. wide drums on the rear wheels, their operation being effected through the Steel-draulic system. Tires on the rear are 40 by 12 in. solids.

Expenditures of British Air Forces for 1926-27

ACCORDING to estimates introduced in the House of Commons by the British Air Minister recently, it is planned to spend £16,000,000 on the British Air Service during the coming year. Of this total amount, £5,351,000 is to be spent for airplanes, engines and spares, which compares with £5,864,000 set aside for this year's estimate.

Sir Samuel Hoare, Secretary of State for Air, said, the reduction in the appropriation for the purchase of new equipment might have an adverse effect on the aircraft industry, which is chiefly dependent on the Air Ministry for orders, but it has been decided to spread the orders so as to keep the greatest number of key men in the industry.

Up to the present the Air Ministry has not permitted the sale of new models of aircraft to foreigners until after they had been available to the British air forces for a number of years, which in some cases meant until they had become practically obsolete. This rendered it difficult for British aircraft manufacturers to compete for foreign business, and Sir Samuel said that these restrictions would be eased in the future.

For the upkeep of the experimental establishment an appropriation of £95,000 is called for, and for research work £241,000 will be spent. In this connection attention is called to the fact that the research department of the air service has been reorganized recently under a Director of Scientific Research. New research problems have been created by the invention of the Auto-Giro type

of machine recently demonstrated to officers of the British flying forces by Senor de la Cierva. A number of these machines are being built in England and their possibilities will be fully tested out.

The appropriation for lighter-than-air development has been cut from £440,000 this year to £332,000 for next year. The Government is interested in the construction of two large airships, one in a Government plant, the other in a private establishment, both to be of 5,000,000 cu. ft. capacity. The work on this program was delayed somewhat by the breaking away of the R-33 from her mooring mast last spring, which retarded the carrying out of necessary experimental flights until late in the year.

For civil aviation a total sum of £462,000 is asked, of which £216,500 is for works, buildings and lands, and £180,000 for subsidies.

The Government has somewhat modified the terms of its agreement with Imperial Airways, Ltd., which now calls for a minimum annual flying of 425,000,000 hp. miles, instead of 1,000,000 miles, the evident object of the change being to encourage the use of larger planes and thus to increase the economy of the services.

An additional contract has been made between the Government and Imperial Airways, Ltd., in accordance with which this concern is to put on a bi-weekly service between Cairo and Basrah via Bagdad and between Basrah and Karachi, the plan being to eventually establish a weekly service between Egypt and India.

Bugattis Win First Three Places in 1926 Targa Florio Cup Race

Most difficult speed contest in world won
by French cars. Leader averages
45.6 m.p.h. One driver killed.

By W. F. Bradley

FIRST three places in the annual 335½-mile race for the Targa Florio Cup in Sicily this year were won by Bugatti cars driven respectively by Constantini, Minoia, and Jules Goux. The race is considered the most difficult in the world, for the 67-mile circuit over the mountains comprises 1400 distinct turns, varies in altitude from sea level to 3000 feet and is of such a nature that high gear can be used only for a distance of eight miles.

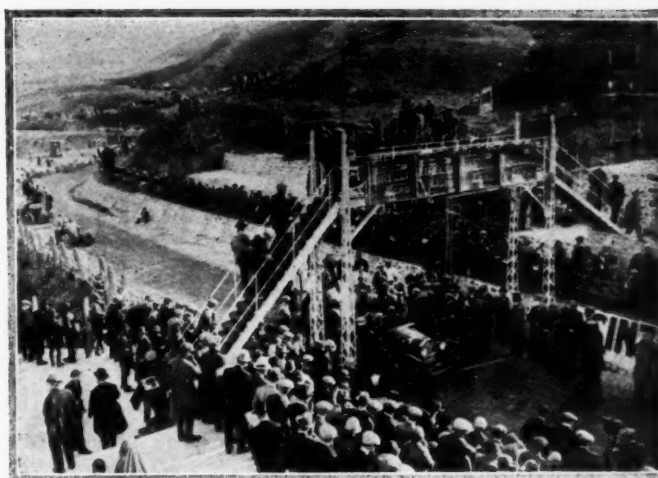
Constantini averaged 45.6 miles an hour, set up a lap record at 46.8 miles an hour and on four out of his five laps broke last year's record. It is estimated that this represents the limit of speed over these roads, whatever the power available. The three Bugattis won \$10,400 in cash prizes, in addition to trophies.

Thirty-six cars faced the starter, but the real competition lay between the official team of straight-eight Bugattis, having special roller bearing engines of 143 cu. in. piston displacement, driven by Constantini, Minoia and Goux; the four supercharged twelve-cylinder 122 in. Delages, handled by Count Masetti, Rene Thomas, Divo and Benoist; and two sleeve valve Peugeots driven by Andre Boillot and Louis Wagner. Among the notable independents and amateurs were Materassi, on a special Itala built up with one-half of a Hispano-Suiza aviation engine; Maserati with a straight-eight supercharged 91½ in. Maserati Special; and Andre Dubonnet with a 122 in. roller bearing Bugatti.

Couldn't Take the Turns

Although the Delage cars were the fastest on the course, they soon proved themselves unsuitable for these special conditions. There was disproportion between their power and adherence; they were slightly too long and difficult to hold on the turns. Practice showed that if they were driven all out, a complete tire change had to be made every 95 miles.

Sixteen miles from the starting line Count Masetti overturned with No. 13 Delage and died later from his injuries. Masetti, who was a wealthy sportsman from Florence, was looked upon as one of the cleverest drivers in Europe and particularly brilliant on mountain roads. He won the Targa Florio race in 1921 on a Fiat and again the following year on a Mercedes. Last year he drove for Sunbeam in the leading European races and



Start of the 1926 Targa Florio Cup Race, Palermo, Sicily. The car at the starting tape is the Bugatti driven by Jules Goux, who finished third

was preparing to race for Talbot in the coming French Grand Prix.

Owing to a broken oil lead Andre Boillot was forced out with a seized sleeve on his Peugeot. Louis Wagner went off the road and lost ten minutes in getting back again. Maserati broke one of his intake manifolds, thus losing half an hour. Andre Dubonnet was unable to start his Bugatti after a stop at the pits and was thereby thrown back about eight minutes.

Servo Brakes Used

The Dewandre vacuum servo brake was used on the two Peugeots, while Dubonnet's Bugatti was fitted with the Westinghouse servo mechanism. The Delages had their own type friction servo. The three winning Bugattis entered by the firm were exact duplicates of last year's 122 in. racing models, except for the increase in size to 2.4 by 3.93 in. bore and stroke, thus raising the piston displacement to 143 cu. in. In addition to being the easiest handling cars on the turns, this increase in cylinder size gave them the extra 20 hp. needed for fast climbing. The winning Bugattis were fitted with two Solex carburetors, Bosch magneto and plugs and Michelin clincher bead tires on special aluminum wheels.

Results of race are as follows:

1. Constantini, Bugatti	7:20:45
Average speed 45.6 miles	
2. Minoia, Bugatti	7:30:49
3. Goux, Bugatti	7:35:56
4. Materassi, Itala	7:44:26
5. Dubonnet, Bugatti	7:45:00
6. Wagner, Peugeot	7:52:25
7. Balestrero, O. M.	8:20:35
8. Candrilli, Steyr	8:33:55
9. Maserati, Maserati	8:37:11
10. Croce, Bugatti	8:45:21
11. Caliri, Bugatti	8:50:46
12. Montanari, Bugatti	8:59:21

61 cu. in. class, distance 201.3 miles

1. Bozzacchini, Salmson	5:14:40
Average 38.38 miles	
2. Rallo, Salmson	5:33:56
3. Zubiaga, Austin	5:37:20
4. Geri Gino, Salmson	5:47:42
5. Starrabba, Amilcar	6:30:25

Heavier Tax Depreciation Allowance on Machinery is Urged

Movement suggested at Gear Manufacturers' Convention to raise maximum allowed in tax reports from 10 to 25 per cent yearly. Speaker tells how oil infection is eliminated by disinfectant.

By P. M. Heldt

EVER since oil was introduced as a coolant in machine shop practice, to permit of raising cutting speeds, there has been a great deal of trouble from infection among workmen. It is customary in all machine shops to post warnings that small injuries must be immediately attended to, and in all of the larger shops first aid stations and even nurses and doctors are provided, but the number of infections is great in spite of these precautions.

In a paper presented at the tenth annual meeting of the American Gear Manufacturers Association, W. D. Price, service director of the Warner Gear Co., Muncie, Ind., made the announcement that he and J. H. Orr, maintenance engineer and chairman of the safety committee of the Warner Gear Co., had discovered a method of preventing the spreading of disease through cutting oil.

Paper on Gear Wear

A number of interesting technical papers were read at the meeting, which was held at the Book-Cadillac Hotel, Detroit, May 13-15, including one on "Wear on Gear Teeth" by Earle Buckingham of the Massachusetts Institute of Technology, and another on "Gear Tooth Stresses," by S. Timoshenko and R. V. Baud, research engineers of the Westinghouse Electric & Mfg. Co. Many reports were received from sub-committees of the Standardization Committee, but most of these were progress reports and dealt with the activities of the respective sub-committees during the past half-year and their plans for the future, and few definite recommendations were made.

The meeting was one of the best attended held in recent years. In his opening address President E. J. Frost referred to the benefits of trade organizations. "It is fortunate, indeed," he said, "that the old, self-centered, suspicious and egotistical manufacturer is fast being replaced by a new type whose business horizon can compass something for the other fellow as well as for himself. An idea akin to this is expressed very well in a little booklet I received some time ago from the Bank of Manhattan, N. Y., entitled 'Up From the Soil,' in which the writer says, 'Let any group or bloc lose its sense of the whole in order to seek for itself disproportionate advantage without reference to the effect on the others and disaster ensues; orderly government, the safeguard of human society, is imperiled and the welfare of even the self-seeking element disappears in the danger that comes to all.'"

Reference was made in the address also to the subject of industrial relations: "It has been quite common

in the past for manufacturers to think in terms of their investments in material things such as land and buildings, machinery and inventories of goods, either finished or in process, giving little consideration to that most vital item, human effort. The men of the shops do not want patronizing in the way of welfare work, club rooms, picture shows, reading rooms, and the like, unless they have a definite voice in their establishment, control and support. What they crave is a just recognition of the part they play in the great economic game and a fair share in its returns," he said.

"My observations lead me to believe that you men of the gear industry are above the average in your attitude toward labor and this in turn points to one good reason why most of us can say, in all honesty of belief, that we have the finest lot of workmen of any shop in our respective communities."

A warning was given against over-expansion in good times, which brings on proportionate grief when the wave of business activity recedes. Many business men conduct their affairs along the same lines as the stock market lamb—buying to their limit and beyond when prices are at the top and selling when they are near the bottom. "We should carefully study our expansions so as to buy when prices are lowest and, more than all else, have equipment all set ready to go when the wave of improved conditions comes," said Mr. Frost. "Few of us, however, have nerve enough to do this."

It was pointed out by Mr. Frost that the maximum depreciation allowed by the Government in income tax reports (10 per cent) is far too low for certain classes of machinery and that manufacturers should be allowed to wipe off 25 per cent, and the suggestion was made that the public policy committee or the representative of the Association in the Chamber of Commerce of the United States bring the matter up for discussion in a national way, looking toward a change in the present law.

Airplane Talk by Stout

At the banquet, held on Friday evening, William B. Stout of the Stout Metal Airplane Division of the Ford Motor Co. gave a talk on "Air Transportation," while one of the members of the Association, R. G. Horsburgh, who recently returned from a trip around the world, showed moving pictures of various scenes from this trip, chiefly from the Far East.

In his talk on "Oil Infections" Mr. Price said that during the first ten months of 1925 the Warner Gear Co. experienced an epidemic of oil infections which cost it 900 days of lost time and its compensation carrier

many hundreds of dollars, one case alone occasioning a loss of nearly a thousand dollars.

The use of a germ destroyer or germicide suggested itself, but information from chemists was to the effect that all germicides are inert in oil. The thought occurred that perhaps the germs were present in the oil in the first place, but the oil company explained that the oil had just passed through a distillation process under heat which no germs could survive and microscopic examination bore out this contention. The germs, therefore entered the oil after it was placed in use in the shop.

Study and experiment led to the conclusion that the oil itself is a partial germ destroyer. One-half inch below the surface in the oil tank practically all air is excluded, and no germs can exist without air. This, however, gives only slight protection against infection.

Coal Tar Disinfectant

The solution of the problem was found in the use of a coal tar acid disinfectant of which there are several on the market under various proprietary names. The particular disinfectant which has been used is added in the proportion of one per cent when the oil is first supplied to the machine, and one per cent at the time of renewal. In the case of hobbing machines, in which the oil reaches a temperature approximately 20 deg. higher than in other machines, it was found necessary to add disinfectant to the amount of 1 per cent once between oil renewals. It seems that the disinfectant is somewhat volatile and is lost at a rate depending upon the temperature of the oil.

Only three slight cases of infection have occurred in the shops of the Warner Gear Co. since this germ destroyer was first applied, in spite of the fact that there was an epidemic of influenza during that period and men recovering from the "flu" are particularly susceptible to attack owing to their weakened condition. It is believed that these cases were due to the fact that the necessity for a more frequent renewal of the disinfectant in the case of hobbing machine oil had not yet been recognized.

Mr. Price pointed out that wiping rags also have much to do with infection. Rags are used by all workmen to remove oil from hands and arms, and they generally are common property. Although the purveyors of the rags claimed them to be clean, they were found to always contain germs. The source of supply was changed four times, but the company is not yet satisfied and the installation of a sterilizer is contemplated. Moreover, the wiping rag has been raised to handkerchief class and is now regarded as intimate personal property, so it no longer serves to spread germs. While the infection cases were numerous the compensation insurance rate was increased, but it has been reduced again since.

Workmen are Watched

In the course of the investigation it was found that the same pus-forming bacteria are the cause of skin eruptions, pustules, boils and other common pus-forming sores. The company now does not permit any person suffering from pus containing skin sores to work in oil. Before returning to work any person so affected must submit to an examination. Foremen inspect their men frequently for any skin trouble, and the men appreciate the efforts and report such cases immediately.

Hair follicle rash caused by continued working in oil has been done away with. Men who have worked in oil for years have come to regard that fine rash as part of the work, although they were irritated and suffered continually. This elimination of oil rash was not aimed

at directly but is an incidental advantage of the use of the disinfectant.

Three companies were elected to membership in the Association, namely, Warner Corp. of Muncie, Ind., Accurate Gear Corp., Brooklyn, N. Y., and Pratt & Whitney Co., Hartford, Conn. Several new representatives of member corporations were also elected, including the first lady member of the Association, Miss Myra Hamilton of the Hamilton Gear & Machine Co., Toronto, Canada.

Chairman B. F. Waterman read the reports of the General Standardization Committee and of the Sectional Committee on Gears of the American Engineering Standards Committee. He reviewed the work which had been done by the various subcommittees and the status of standardization in the various branches of the industry. The materials sections of the Sectional Committee on Gears he said would have a meeting at Pittsburgh on Monday of this week.

E. W. Miller, chairman of the A. G. M. A. Research Committee on Gears, read a preliminary report on the work which has been done on the Lewis gear testing machine at Massachusetts Institute of Technology. The experiments which have been made to date bear on the influence of error in tooth form and of the modulus of elasticity of the gear material on the strength of the teeth.

It appears from the tests made to date that the load required on the testing machine to keep the teeth in contact varies somewhat less rapidly than the power of the pitch line velocity and it is proposed tentatively to express the load on the teeth by a fraction whose numerator is the $3/2$ th power of the pitch line velocity and whose denominator is the sum of the velocity and a constant.

It was found that the effect on the load of errors in the tooth profiles, is directly proportionate to the relative magnitude of the error and substantially independent of its character.

Research on Strength of Teeth

One of the most interesting problems which it is hoped to solve with the aid of the machine is that of the effect of the modulus of elasticity of the material on the load on gear teeth. It appears that the loads vary directly with the modulus of elasticity. This is to be verified by a series of tests on a set of 3 d.p. gears, all of the same size but made of cast iron, steel, bronze, aluminum and non-metallic composition, which the Newark Gear Cutting Machine Co. has donated for the purpose.

Since the load on the teeth seems to vary directly as the modulus of elasticity of the material it is found that it varies also with the degree of elasticity of the tooth form. This assumption may be verified by test on gears with different forms of teeth. So far practically all tests have been made on gears having teeth of similar form. It is obvious that the elasticity of both the pinion and gear teeth will affect the stress in either set of teeth, hence a formula for tooth stress will probably have to incorporate the moduli of the materials of both pinion and gear and factors representing the degree of elasticity (or of rigidity) of this form of pinion and gear teeth.

The report of the Spur Gear Committee, J. L. Williamson, chairman, was one of progress only. It was recommended in this report that Item 5 of the standardization program, which relates to methods of installation and calls for the presentation of material in chart form, be stricken out, as it is believed impossible to properly handle the subject in this way.

Considerable discussion followed the presentation of the report of the Keyway Committee, R. B. Zerfey chairman. The work of this committee parallels that of a committee of the American Society of Mechanical Engineers, which has been standardizing keys for cold rolled shafting. This

latter committee has now finished its work and has standardized both square and flat keys for shafts of all sizes up to 6 in. In the past it has been the contention that for gear work there should be a single standard, square keys being used for shafts up to perhaps 4½ in. diameter and flat keys above that. After an extended discussion it was concluded, however, that even with the smaller sizes of shaft there are occasions when it is impossible to use a square key, owing to insufficient material in the hub, and it was therefore finally decided that both types of key should be standardized for the whole range of sizes.

The A. S. M. E. standard for keys for shafting extends up to 6-in. shafts only, but for industrial gears larger shafts are often used, and the Committee was therefore instructed to extend the tables to 13-in. shaft diameter. The Committee made the proposal that the 5/16 in. square key be eliminated from the list, jumping from ¼ to ⅜ in. size, but it was the consensus of opinion that this was too big a jump, and the Committee was instructed to replace this size in the table, on a motion made by G. M. Bartlett. Mr. Bartlett in this connection brought up the subject of preferred numbers and suggested that the sizes adopted should follow a geometrical series. In line with this suggestion he made a motion that the 7/8 in. size of key be eliminated, as the jump from ¾ to 1 in. is no greater than that from 3/16 to ¼ in., but this motion met with no support. In connection with the A. S. M. E. standard for keys, tolerances are given for the key stock and for key ways, which tolerances permit of a limiting freedom or looseness of 0.003 in. It was agreed that such fits would be entirely unsuitable for gear work and the matter of tolerances is therefore to be considered separately from the A. S. M. E. standard.

Nomenclature Committee

The Nomenclature Committee, D. T. Hamilton chairman, had been occupied chiefly with the subject of symbols or abbreviations for gear elements. Two systems had been worked out and had been sent for comment and approval or disapproval to members of the Sectional Committee on Gearing. The first contemplates the use of letters and sub-letters or suffixes, while according to the second, instead of sub-letters there are to be used small or "lower case" letters on the same level as the main letter. The objection to the first system is that it cannot be readily handled on the typewriter, while that to the second system is that it gives the impression that the first letter represents a quantity which is to be multiplied by a quantity represented by the second letter. There was a majority vote (in the replies to the questionnaire) in favor of the second system, but such weighty reasons were advanced against it that it was decided to refer the matter back to the Committee for further consideration.

The Transmission Committee, S. O. White, chairman, plans to suggest for adoption a new nomenclature for transmissions on which a corresponding committee of the S. A. E. has been working and which will be acted on at the coming French Lick meeting. This committee is also circularizing the members with respect to transmission and clutch housing mounting dimensions. The Committee is suggesting the adoption of S. A. E. standards relating to this subject.

A horse power formula for non-metallic gearing was presented by the Non-Metallic Gearing Committee, F. G. Sorenson chairman, and was adopted. This formula reads as follows:

$$H. P. = \frac{0.000095 \times s \times fw \times y \times plv}{dp}$$

where s is the safe working stress of the material (which varies with the speed); fw , the face width in inches; y , a constant varying with the number of teeth; plv the pitch line velocity in feet per minute and dp the diametral pitch. The safe working stress for static load is set down at 6000 lb. p. sq. in., and this is reduced for dynamic loads by a velocity factor which for the present is to be the same as the Barth velocity factor used in connection with the Lewis formula for metal gears. It is realized that this does not accurately represent the variation of stresses in the teeth of gears of non-metallic materials and it is hoped that the tests with the Lewis machine will furnish data on the basis of which a more precise velocity factor can be determined later.

Inspection Practice

A slight change in its recommended practice for the inspection of disk type gear cutters was recommended by the Inspection Committee, F. G. Eppley, chairman, to bring it into line with its recommended practice for the inspection of gear shaper cutters. The former practice allows of the comparison of the form or outline of a cutter with a theoretically constructed tooth outline or with a tooth of a cutter that has proven satisfactory in service, while in the case of gear shaper cutters the comparison is to be made only with a cutter of proven merit. It was explained that the reason for recommending a comparison with a theoretically constructed curve was that when a new form of cutter is first made there is no cutter with which it can be compared by the projecting apparatus, and in that case the best that can be done is to compare it with a theoretical curve. The report was referred back to the Committee.

In a progress report of the Tooth Form Committee, prepared by Henry J. Eberhardt, chairman, it was stated that many items of the Committee's program had been given consideration. A study had been made of the proposed German 20 deg. pressure angle, full depth tooth, the general proportions of which are the same as those now in use in this country, and the proposed modifications of the addendum and dedendum had been criticised. It was planned to present at the next meeting an American standard full depth tooth with a 20 deg. pressure angle. Much work had been done on generating hobs, in connection with which the modification of the involute form presents considerable difficulty. At present the prospects seemed good of evolving and defining a basic rack which would satisfy all cutter manufacturers.

There has arisen also a demand for action on 14½ deg. pinion diameter enlargements, and the Committee is working on a table of 14½ deg. full depth tooth pinion diameter enlargements which will be similar to a corresponding table for herringbone gears now among the records of the Association.

Proposed American Standard

The 14½ deg. composite system, full depth tooth, which the A. G. M. A. adopted at its last meeting, and the 20 deg. stub involute tooth are being issued as proposed tentative American standard spur gear tooth forms by the A. E. S. C. Sectional Committee.

The Metallurgical Committee, Chester B. Hamilton, chairman, has completed its work on cast steel, and this item is about to be passed upon by the Sectional Committee. It is planned to take up next Item 5 on the program, the specification of hardness limits which will be acceptable when purchasing bars, forgings or castings of the various A. G. M. A. specifications. A questionnaire has been prepared and will be sent out to the membership, through which it is hoped to gain information as to what are the

desirable hardness limits for forged and rolled steel, of the different specifications. Members are requested to base their replies on lathe and rotary spur gear work, using good high speed steel tools.

In regard to the specifications of nickel steels the membership has been circularized as to the advisability of raising the lower manganese limit without raising the upper one above its present value of 0.60 per cent, and also as to the advisability of introducing a control factor in the case of the 40-50 point carbon, water-quench steel so as to limit the combined manganese and carbon content to between 0.85 and 1.05 per cent. The replies to both suggestions were favorable, and action by the American Engineering Standards Committee on the matter has been delayed only by a change in the personnel of the subcommittee.

New Bevel Gear Tables

The Bevel and Spiral Bevel Gear Committee, E. F. McMullen chairman, had no definite suggestions at the meeting, but it was announced that the Gleason Works had issued a new book on Straight Bevel Gears which contains a lot of new material on bevel gear dimensions, as well as some matter that has been published previously.

Additional work on the standardization of worm gearing for industrial purposes has been done by the Worm Gear Committee, J. C. O'Brien chairman. Formulas have been worked out for all of the bearing loads and other forces that result from the transmission of power by worm gearing, and tables of constants are being worked out which when completed will greatly facilitate worm gear calculations.

The Library Committee, E. J. Noble, chairman, had made inquiries as to the cost of a monthly service covering a bibliography of gear subjects, and it was decided to subscribe to this service for a year.

The election of officers was scheduled for this meeting. The four retiring members of the Executive Committee, viz., A. W. Copland, R. P. Johnson, George L. Markland, Jr., and B. F. Waterman, were re-elected, and at a meeting of the Executive Committee the old officers, with E. J. Frost at the head, were re-elected.

An address on an economic subject—"Are You Using Pre-War Stuff?"—was made by Mason Britton of the *American Machinist*. Mr. Britton said the 12 years since the outbreak of the war have been crowded full of history but some of us may at times forget that 1914 is just as remote industrially as it is politically. In these twelve years, while the population of the United States has increased 18 per cent, the productivity of the nation has increased 35 per cent, a rate almost double. Our railroads today are carrying 20 per cent more freight than in 1914 with practically the same number of employees. Our farms are producing 35 per cent more in volume of crops with an actual decrease in the number of farmers.

Economic Life of Machine Tools

This advance in productivity has been brought about by the increased use of machinery. The rigid cutting down of immigration has resulted in a shortage of labor, and increased use of machinery makes up for the deficiency in labor.

In the past twelve years, over 5944 new metal-working machines and tools have appeared on the market—improvements on old types, new developments, new creations of mechanical genius—all designed to increase output and accuracy and to decrease upkeep and labor.

The question then arises, How much better must a new machine be to warrant the scrapping of an old one? *American Machinist* has investigated the practices of a

number of widely known manufacturers with respect to machine tool replacement. The Schenectady Works of the General Electric Co. have a force of inspectors watching the machine tools. Each inspector sees to it that the machines under his care are oiled regularly, that small breaks are repaired at once and that the machines are taken out of service for overhauling when necessary. This shop also has a force of "destructive fault finders" whose duty it is to spot the machines that are running behind in efficiency, to recommend that they be transferred, sold, or sent to the scrap heap.

In the paper by S. Timoshenko and R. V. Baud the stresses and deflections of gear teeth were discussed. By using the photo-elastic method the stress concentration at the tooth root had been studied and the factors of stress concentration established for various radii of the fillet. By using the Hertz theory the local stresses at the surface of contact of two teeth in mesh were discussed and it was shown that the most unfavorable conditions exist at some depth beneath the surface of contact. Equations were given for calculating the deflection of teeth and it was shown that this deflection is usually less than the inaccuracies in commercial gears.

In his paper on the "Relation of Load to Wear on Gear Teeth," Earle Buckingham started from the Hertz equation for the maximum specific compressive stress in two cylinders pressed together, and transformed it to apply to gear teeth. This transformed equation included the term

$$\frac{S^2}{0.35} \left(\frac{1}{E_1} + \frac{1}{E_2} \right)$$

which is designated by K , and by making this substitution the equation for the maximum specific compressive stress becomes

$$W = D_1 F K Q \sin A,$$

where W is the tooth load in pounds; D_1 , the pitch diameter; F , the face width; K , the stress factor; Q , a ratio factor ($2 D_2 / (D_1 + D_2)$), and A the pressure angle.

This equation was applied to a large number of different gear drives and solved for K . The results were far from uniform. One fact stood out, however, namely, that when the stresses thus determined were below the elastic limit the wear on most of the gears was not appreciable, whereas when the stress was above the elastic limit the gears stood up in some cases but in most they showed rapid wear.

It might seem that wear should be proportional to the specific pressures, but in practice this is not the case; there is evidently a critical point below which the wear is negligible and above which it is very rapid.

At the Saturday morning session a lawyer representing the Ford Motor Co. appeared before the association in connection with a patent matter. The patent mentioned covers a method of chamfering gears that are slid into mesh sideways, whereby the two gears are chamfered to different angles, so that line contact is obtained. It appears that the teeth of starter gears are frequently chamfered in this way, those of the pinion being chamfered to one angle and those of the gear to another angle. The reason for this, it appears, is that the pinion is made by the starter manufacturer and the gear by the car manufacturer or a specialist, and since the exact angle of chamfer is considered of little consequence, no effort is made to see that the gear tooth chamfer matches the chamfer on the teeth of the Bendix drive pinion. The difference in the chamfer therefore is an accident and not intentional.

Army-Navy Aeronautical Standards Recommended for S. A. E.

*Reports on 37 subjects to be presented by 14 divisions of
Standards Committee at coming spring meeting
of Society. Fewer roller bearing sizes.*

FOURTEEN divisions of the Standards Committee will present a total of 37 reports at the coming spring meeting of the S.A.E. at French Lick Springs. The Standard Committee Report will be handled at the meeting this year in a new way. It will be made at a dinner meeting on the opening day, June 1, starting at 5 p. m., and in case it should be impossible to complete the work at that session, an adjourned dinner meeting will be held the following evening.

Owing to the fact that the Government is the only important purchaser of aircraft and both the Army and Navy in the past have had their "specifications," which practically amount to standards, the Aeronautical Division considers it superfluous for it to work up special standards for this branch of the industry. During the past two years there have been a number of Army-Navy Air Service conferences with a view to unifying the specifications for aircraft for the two services, so as to avoid unnecessary diversification. This has led to the formulation of Army-Navy aeronautic standards. These have been reviewed by the Aeronautical Division of the committee and a considerable number of them have been given the approval of the division and are recommended for publication in the S.A.E. handbook.

As a result of the development of balloon tires the recommended practice for wood spokes for passenger car and truck wheels, adopted in 1918, no longer represents current practice, and it is therefore suggested that these specifications be cancelled.

Thickness of Felloe Bands

At present the standard for felloe bands does not cover the width and thickness of the felloe and felloe band. In the past it has been the practice to make the felloe band $\frac{3}{4}$ in. less in width than the nominal width of the tire, but recently it has become necessary to make it the full width of the tire, and it is therefore considered desirable by the Axle and Wheels Division to include in the standard the width of the felloe band, the thickness of the felloe band and the thickness of the felloe, all with tolerances. The dimensions are given in a table.

A set of standard sizes of roller bearings is proposed by the Ball and Roller Bearings Division, the report having been worked up by a sub-committee composed of T. V. Buckwalter, of the Timken Roller Bearing Co., and G. H. Adams, of the Bock Bearing Co. The new standard specifies the dimensions of 174 cones and 57 cups, which is said to be a great reduction from the number of cones now being made by the roller bearing industry. Some apprehension has been expressed by consumers lest the suppression of all designs not included in the standards list would cause difficulty to the service departments, but

the various roller bearing manufacturers have given assurance that they will continue to provide service parts for all bearing sizes now being made as long as there is a demand for them, and this led to a withdrawal of opposition to the proposal. Data sheets published by the different manufacturers in the future will list only the sizes contained in the proposed standard.

It is proposed to cancel the standard for metric roller bearings, which was adopted in 1916 but has not come into practical use.

Generator Mountings

A complete revision of standards for generator mountings is proposed. The No. 1 flange and shaft end dimensions are to be cancelled because it has been found that the No. 2 is generally used for the range of sizes for which the No. 1 was originally intended, and in the few cases where No. 1 is followed to any extent, many modifications are made in it.

The boss for the mounting flange is to be specified as of 3 in. diameter which permits of bringing the generator ball bearing close up to the drive gear. In the present standard this diameter is smaller, which necessitates placing the bearing at some distance from the drive gear and results in increased overhang of the generator.

It has been found that for motor-coach work the flange mounting is not suitable; owing to the more intense vibration the mountings constantly come loose and some support at the outer end is needed. The reason probably is that with these larger generators it is impracticable to increase the dimensions of the flange proportionately. It is therefore recommended that the present size of bracket mounting, which is intended for passenger car engines, be designated No. 1, and a No. 2 is being proposed for use on motor-coaches. This latter mounting already is a standard with all generator manufacturers, having been widely used for motor-coach applications.

Starting motor mountings also have been revised. To the table of flange dimensions a column is added stating whether the installation is for inboard or outboard mounting or for both. In the drawing of the inboard installation a distance of $\frac{9}{16}$ in. is specified between the outside of the flywheel rim and the pitch circle of the flywheel gear. In the drawing for the outboard installation and in that for the barrel-type mounting, this same dimension is changed from $\frac{17}{32}$ to $\frac{9}{16}$ in. A flange-type starting motor mounting using a 13-tooth large shift pinion is included for heavy-duty engines. With barrel-type mountings the limits of the bore in the flywheel housing are to be 3.500 and 3.503 in.

The Electrical Equipment Division recommends the substitution of the Bureau of Standards salt spray test for the copper sulphate test for testing the galvanizing of

flexible conduit. The copper sulphate test now specified is preferred by the manufacturers of steel conduit, because of its rapidity, but the division believes that the salt spray test (which requires 24 hours), is more desirable from the standpoint of the user, as it is more reliable with respect to the absence of pin holes and the ability of the conduit to resist weather conditions. The tensile stresses which the conduit must withstand have been increased 30 per cent and a breaking test has also been included.

A Sub-Division of the Electrical Equipment Division has been considering a revision of the standard for insulated cable. The Sub-Division recommended that the present requirement, that at least 20 per cent of the rubber insulation on cables shall be new rubber, be dropped, the reason advanced for this suggestion being that there is no reliable test to determine what percentage of the rubber is new and what reclaimed. Instead, it was suggested that the insulation shall show a tensile strength of not less than 500 lb. p. sq. in. at between 50 and 90 deg. Fahr. during a period not less than 48 hours and not more than three months after its vulcanization. When this proposal was submitted to the Division the car manufacturer representatives objected that three months was not a sufficiently long period, and in order to be satisfactory the insulation should maintain the specified strength for at least a year. The tensile test applies only to rubber cable insulation more than 0.045 in. thick. The figure of 500 lb. p. sq. in., which represents a lowering of 100 lb. p. sq. in., also was objected too, and in the recommendation to the Standards Committee the old figure of 600 lb. p. sq. in. is restored.

A timer-distributor mounting for heavy-duty engines has been designed. This is particularly suitable for motor-coach and taxicab engines.

The present recommended practice for piston ring grooves is to be cancelled. Instead it is proposed to recommend that the width of the rings be made basic, with a plus tolerance of 0 and a minus tolerance of 0.0005 in., and that no tolerances be set for the width of the ring groove, as the fits and tolerances must depend on the conditions of service. It is felt that making the width of the ring basic and varying the width of the groove to meet special conditions will be a great help to the manufacturers of piston rings, as it will tend to reduce the number of widths called for.

Over-size Pistons and Rings

New standards for over-sizes for pistons and rings have been under consideration for some years, and the Engine Division now will recommend the adoption of standard over-sizes of 0.005, 0.010, 0.015, 0.020, 0.030 and 0.040 in., with larger ones, if necessary, in multiples of 0.010 in. Mr. Milbrath, chairman of the Sub-Division on Piston and Piston Ring Over-Sizes, gave a statistical analysis of present practice with regard to over-sizes, from which it appeared that the most popular over-sizes, with the respective number of users, are as follows: 0.010 and 0.020 (40 each); 0.030 (37); 0.015 (29); 0.005 (26); 0.040 (15); 0.060 (13); 0.002 (10).

Complaints having been received that in the standard for engine support arms Nos. 3, 4 and 5, the distance from the center line of the support arm bolt hole to the shoulder of the arm is insufficient to accommodate a pad between the engine arm and the bracket, it is recommended to decrease the distance between the shoulders in these sizes from $23\frac{1}{8}$ to $22\frac{1}{2}$ in.

Since 1921 the Engine Division has been working on proposed standard designs of starting cranks. To cover all requirements both light and heavy-duty of the three

and four jaw and the pin types would be required. The Division felt, however, that most requirements would be met by light and heavy pin types and a heavy four-jaw type, and designs for these three types are submitted for adoption as S.A.E. Recommended Practice.

Three sizes of crankcase drain plugs are recommended by the Engine Division, namely, $\frac{7}{8}$ -18 and $\frac{3}{8}$ and $\frac{1}{2}$ in. pipe plug. The first is uniform in size with the standard spark plug and is particularly adapted for use where no boss is welded to the crankcase pan.

Electric Lighting Plants

Changes are proposed in the standard voltages and engine and generator speeds of isolated electric lighting plants to make them conform to the standards of the Electric Power Club. At present "no-load" speeds of 1200 and 1800 r. p. m. are specified, but it is now proposed to specify "full-load" speeds of 1150 and 1720 r. p. m., and an additional "full-load" speed of 860 r. p. m. is recommended for generators of 2 kw. and over. Instead of a nominal voltage of 110 volts a service voltage of 112 is to be specified in future, and there is to be another voltage of 64 volts for all plants.

A new nomenclature for headlamps is proposed by the Lighting Division.

With two-filament bulbs it is desirable that the bases and sockets be made in such a way that the bulb can be inserted in one way only, otherwise it may happen that when a bulb is replaced it will show bright when the switch is turned to "dim" and vice versa. It is therefore proposed to adopt a design which is now being used by Buick, Hupp and Studebaker, in which one of the pins on the base is offset 15 deg. from the center line through the contact points, and one of the slots in the connector socket is offset correspondingly. Otherwise the base and socket correspond to the present S.A.E. standard. The same socket can be used also for combination tail and stop lamps.

Head-lamp manufacturers are laboring under difficulties due to the fact that their products must meet the legal requirements of all the different states, and the Lighting Division therefore has outlined points in head-lamp design which are considered desirable from the standpoint of the car manufacturer as well as from that of the motor vehicle administrator. This is probably a response to the charge of the motor vehicle administrators that difficulties in the enforcement of lighting regulations are due mainly to the use of poor equipment. The recommendations regarding head-lamp design and installation are as follows:

1. The fenders should not be tied together through the head-lamps.
2. The construction should be such as to permit the installation of the lens in the proper position only.
3. The construction should be such that the lens is securely held while the door is being removed.
4. The construction should be such as to protect the lens against excessive local strains.
5. Suitable provision should be made for the drainage of moisture condensing in the head-lamps.
6. The design relation between the socket and the reflector should be correct when the door is installed.
7. The finished reflector should withstand corrosion under normal service conditions.
8. The reflector should be of such design and weight as to show no beam distortion when assembled in the head-lamp.
9. The lamp housing should be rigidly constructed by using metal of suitable weight and/or by stiffening the opening.

10. The head-lamp, with the mounting firmly attached to a fixed support and with a steady pressure of 75 lb., applied for 5 min. to the upper edge of the door parallel with the head-lamp axis, should not cause a permanent distortion, as measured by the deflection of the beam, of more than . . . deg.

11. The head-lamp door should be constructed so that it may be easily attached to or removed from the housing.

12. The reflector should be protected from dust and moisture by a suitable gasket.

13. The reflection factor of the reflector should not fall below . . . per cent after 1 year's service under normal operating conditions.

14. The section of the beam normal to the axis at 100 ft. from a parabolical reflector with a filament 0.10 in. long by 0.10 in. wide should all be within a circle having a diameter of 105 in.

15. The construction should be such as to permit the installation of the reflector in the proper position only.

16. The focusing mechanism should be constructed of such materials that no two ferrous metals work upon each other.

17. The head-lamp socket should be constructed so as to hold the base of the electric incandescent lamp firmly and accurately.

18. Means should be provided for holding the head-lamp socket firmly and accurately in its proper position.

19. Both the head-lamp socket and its guide should be made of non-ferrous metals.

20. Solid current-path type sockets and connectors should be used.

21. The head-lamp mounting should be in the vertical center plane of the head-lamp.

22. The focusing screw should be accessible from the outside when the head-lamp is completely assembled and mounted.

23. The head-lamp should be designed so that not more than one focusing adjustment is necessary.

It is proposed to considerably augment the information given on incandescent lamps, the new table having the following column heads: Rated candle power, circuit voltage, design voltage, amperage, single or double contact, bulb number, bulb diameter, max. overall length, lighting center length and filament construction.

Four molybdenum steel specifications which were adopted a year ago as recommended practice are now proposed for adoption as standards.

The Lubricants Division is working on revised specifications of crankcase lubricating oils and it is expected to have recommendations ready for submission at the Standards Committee meeting. The revision relates to the viscosity ranges and the grade numbers.

Old Standard Cancelled

The hub odometer standard, which was adopted in 1919, is to be cancelled, as it has been superseded in practice by a construction whereby the odometer mechanism is mounted directly in the hub cap or an adapter.

The table of brake lining sizes is to be extended to include widths as large as 6 in. and thicknesses up to 5/16 in., increasing the number of standard sizes from 18 to 37.

Radiator nomenclature has been revised, and in this connection it is pointed out that the term "core" is often erroneously applied to the complete core and tank assembly. In the present standard for radiator design the specifications relating to the tie rod fitting are to be omitted and the following statement pertaining to this subject is to be included: "Tie rod fittings shall be cast integral with the upper tank and shall be designed to take S.A.E. standard

rod end fittings. The use of a tapped hole for rods with a threaded end is permissible."

In connection with water pipe flanges it is recommended that the length of fitting for lap of hose be specified as the minimum instead of as a nominal dimension.

The Screw Threads Division will submit a report embodying a recommendation for the adoption of tables of fits and tolerances for the extra fine series of screw threads. A list of applications of the different proposed fits is also included in the report.

Screw Threads Division

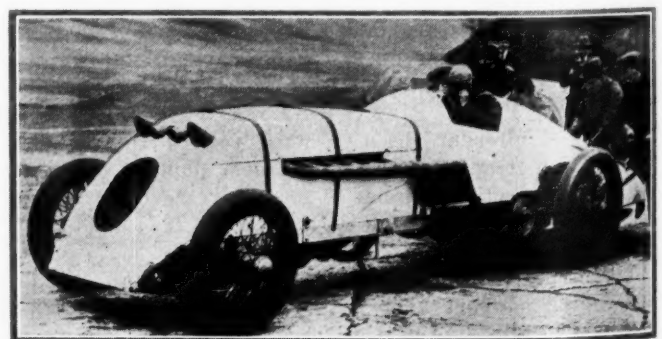
The Screw Threads Division has approved the report of the Sectional Committee on Bolt, Nut and Rivet Proportions of the American Engineering Standards Committee covering the proposed American standard for wrench head bolts and nuts and wrench openings. It is recommended by the Screw Threads Division that seven of the ten tables included in the report be adopted as S.A.E. standards. The only change from the present S.A.E. standard for screws, bolts and nuts necessitated by this is an increase of 1/16 in. in the widths across the flats for nominal diameters of 3/4 in. to 1 1/2 in. The standard for castle nuts is to be changed to accord also with the recommendations of the Sectional Committee; that is, the widths across the flats of 3/4 to 1 1/2 in. nominal size are to be increased 1/16 in.

Some difficulties have been experienced by manufacturers of bolts and screws because of the lack of a uniform practice in measuring the length of usable thread, some users including the point of the screw in their measurement while others do not. It is therefore suggested by the Screw Threads Division that for finished and semi-finished screws and bolts using the fine screw-thread series, the usable length of the thread shall be $1\frac{1}{2}D + \frac{1}{4}$ in. For cap-screws using the coarse screw-thread series, the usable length of thread shall be $2D + \frac{1}{4}$ in. The point of all finished and semi-finished bolts and cap-screws shall be chamfered 35 deg. with tolerances of plus 5 deg. and minus 0 deg., the chamfer to extend to the bottom of the thread. The corner of the chamfer shall be rounded.

The length of all bolts and cap-screws, flat head, fillister head, hexagon head, and the like—shall be measured from the larger diameter of the bearing under the head to the extreme point.

A revised list of names of transmission parts is to be submitted by the Transmission Division.

Car Sets New Speed Record



THE above is from a photograph of the speed car with which J. C. Parry Thomas, of England, established a record of 170.62 m.p.h. recently in Wales, as first announced in our issue of May 6. The car is powered with a Liberty airplane motor. The time given above was made from a flying start and is the average for the mile distance in both directions

Just Among Ourselves

Added Equipment and the Accessory Market

THERE has been a great deal of casting about in sales managers' minds in the last few years as to how much equipment should be included on various models as standard. The sport model, naturally, is heavily equipped, but considerable variations exist in standard model accessories. The average car today unquestionably has more equipment when it leaves the factory than the average car of several years ago. This is in line with the desire of more people for motoring comfort in addition to efficient transportation. Present day conditions, moreover, make almost essential various items, such as bumpers, which a few years ago were considered as merely desirable additions. The phrase "back in the days when windshields were accessories" now is a standard automotive reference. But the amount of equipment placed on particular cars by the factory fluctuates both up and down, and it is almost certain that price competition will continue to keep a good many accessories off certain cars as standard equipment. As one sales manager said the other day, "People shouldn't be forced to buy too many accessories. If they want them, the dealer can sell them to those who ask for them . . ."

* * *

They Do Big Things in South America, Too

WE are prone to think of North America as always being the leader in "bigger and better" things. Often we are, but it is doubtful if any American automobiles have been built which are as large as the Dodge built by Julio Fevre, Dodge Bros. and Graham Bros. dealer in Buenos Aires. This South American representative has built a huge Dodge bus the length of

which is about 100 ft., the width about 30 ft., and the height about 32 ft. Inside this monster vehicle he has a complete exhibit of Dodge cars and Dodge and Graham trucks. So they do big things down in South America, too.

* * *

Noise, Trucks, Trolley Cars, and So Forth

SOME citizens of the District of Columbia have risen to protest against the noise and street vibrations which, they say, are caused by motor trucks. They are asking that motor trucks be kept off certain streets or restricted in some way for these reasons. Hearings are being held before the District Commissioners. Defenders of the trucks say that motorcycles and airplanes cause more noise than trucks. We would add that if there is any more deadly assault on the nerves than is made by the constant passing of trolley cars—the comfort and quietness of which has scarcely been improved 5 per cent in two decades—we don't know what it is. Airplanes, of course, are noisy, but their infrequency and distance from the ground render them less obnoxious than closer noises. Motorcycles are not inherently noisy today; the noisiest part about most motorcycles is the fellow who rides them; he needs regulation much worse than the motorcycle. Proving that other things are noisy doesn't prove that trucks are not, to be sure; it does tend to show the unfairness of discriminatory regulations against one kind of noise, however, while others are allowed to trundle along their merry ways.

* * *

Motorcycle Industry Conquering New Fields

MOTORCYCLE export trade is continuing to go up, despite the fact that the total

number of such vehicles in domestic use continues to slip. The business as a whole is looking up just now, according to reports, so that this year, which we are informed is the 25th anniversary of the official production of the first motorcycle by an American manufacturer, bids fair to be a successful one from the commercial standpoint. Police, delivery and taxicab fields, previously sold to in limited numbers, are being actively developed, while smaller and stronger machines continue to advance an appeal to the sport lover of limited means. The first machine built as a part of a manufacturing schedule in this country, incidentally, came from the factory of the Hendee Manufacturing Co.—now the Indian Motorcycle Co.—and was ridden away from the factory by its designer, Oscar Hedstrom, on May 25th, 1901.

* * *

More Resistance to Sales in England

THE British automotive industry still is studying the possible effects of the upward revision of taxes on commercial vehicles, the reimposition of the McKenna duties on imports of trucks, buses, ambulances and fire engines, and the conversion of a large bulk of the Road Fund to general national purposes, as announced by the Chancellor of the Exchequer in his recent budget statement. None of these moves seem favorable to increasing the market for American vehicles in the United Kingdom. The aftermath of the general strike, too, seems likely to be unfavorable to increased sales, despite the fact that motor vehicles of all kinds were responsible for staying the complete paralysis of transportation with which England was faced. Just means that more merchandising effort will be needed to keep sales up to par in that territory. —N. G. S.

Europe Building Light "Sixes" to Meet American Competition

Twelve to fifteen cars of this type expected on the market before close of year. Voisin in field with model powered by 2.6 in. by 4.3 in. Knight-type engine selling for \$2500.

AMERICAN competition both in home and foreign markets is directly responsible for an increased number of six-cylinder models in France and Italy. During the last few months the Darracq Co. has produced a "six" designed and produced specially to meet the competition of certain American makes and now Voisin has just brought out a light six which he claims is tangible proof that France can build light sixes having all the qualities of American cars allied to French design and refinement.

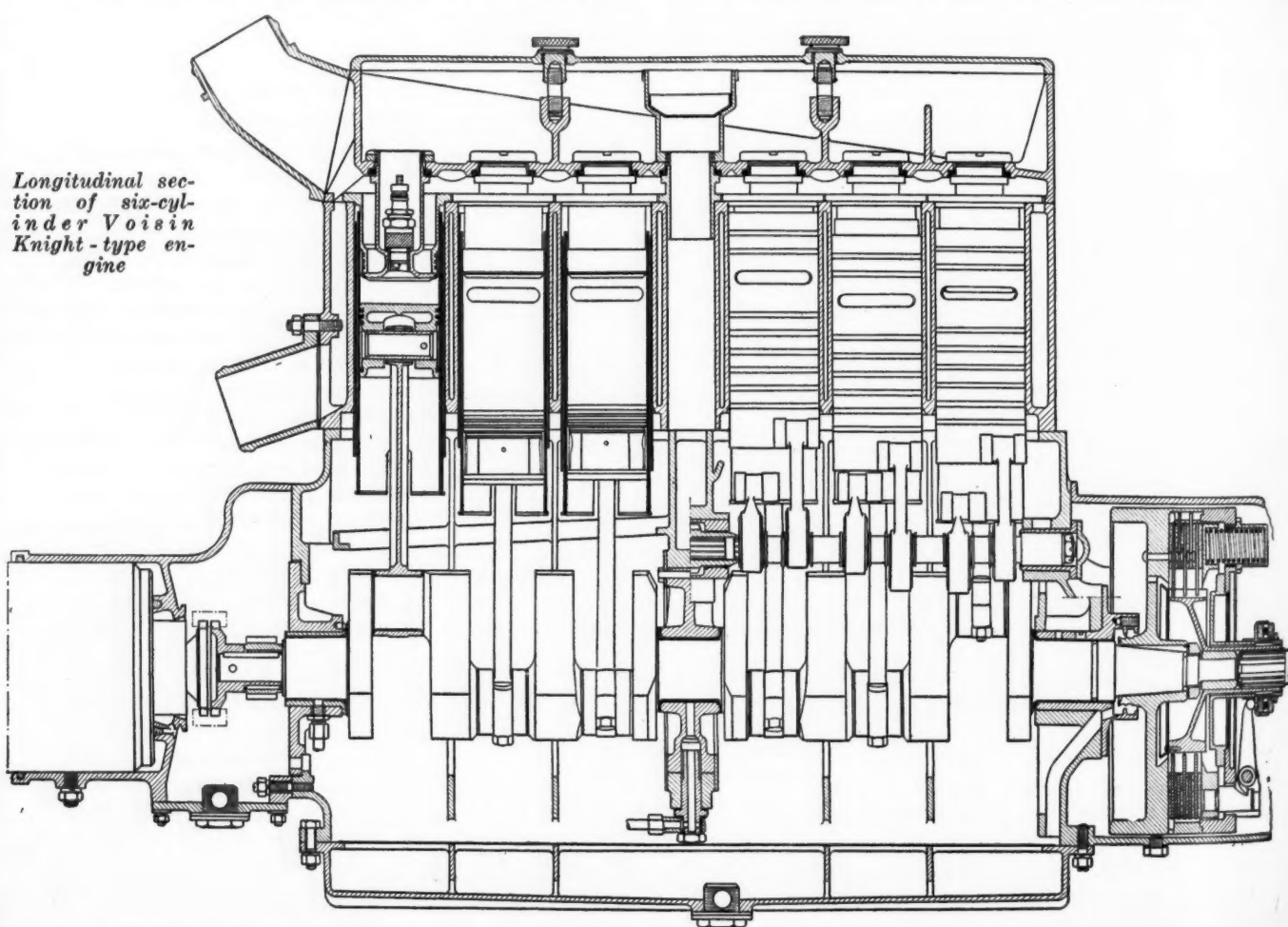
There are indications that before the end of the present year 12 to 15 new models of light sixes, usually not exceeding 130 cu. in. piston displacement, will make their appearance.

The Voisin is the only Knight-type six-cylinder engine built in France. Having a bore and stroke of 67 by 110 mm. (2.6 by 4.3 in.) it develops 66 hp. at 3200 r.p.m.

Chassis weight is 1980 lb. complete with battery, spare wheel and tools, and the sedan weighs 2645 lb., thus giving a weight of 40 lb. p. hp. Wheelbase is 126½ in., track 55 in., rear axle ratio either 12 or 13 to 61, and balloon tires of 775 by 145 mm. are fitted.

Performance of the car, as shown on Monthlery track and proving ground, is 75 miles an hour maximum, and 5 miles an hour minimum on high. A distance of 1000 meters is covered from a standing start in 42 seconds, corresponding to an average acceleration of 1.9 ft. p.s.p.s., and with standing start and finish the same distance is covered in 46 seconds. The car will take a 10 per cent gradient on high, and gas consumption is at the rate of one American gallon per 18 to 20 miles. The car is being offered at 75,000 francs (\$2500) with four passenger sedan body, four wheel brakes and Dewandre servo.

In its general design the six-cylinder Voisin is on the



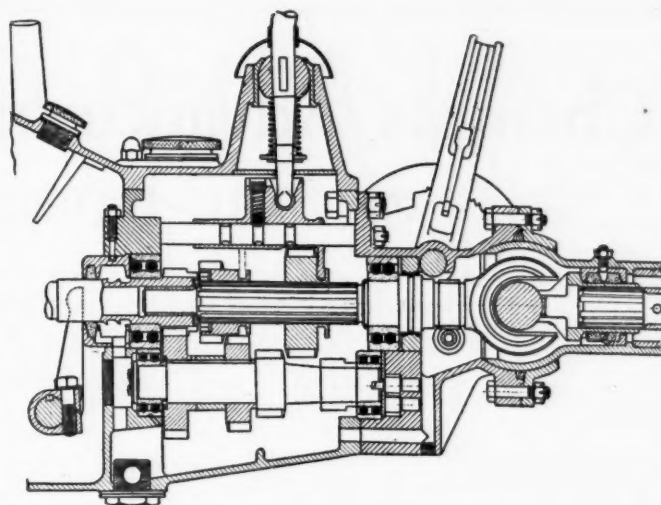
Longitudinal section of six-cylinder Voisin Knight-type engine

same lines as the firm's four-cylinder model. The cylinders have the same bore, which makes it possible to use the same rods and pistons, but the stroke is lengthened. Cylinders are one casting, and the crankcase is one piece with a detachable aluminum oil pan. The crankshaft is carried in three plain bearings and is inserted from the rear. While the rods can be taken out from below, the engine has to be removed from the frame for work on the main bearings. Additional accessibility is given to the rods and pistons by the provision of two inspection covers on the side of the crankcase, these being sufficiently big to allow a piston and rod to be removed.

Delco Battery Ignition

The most important change in the design is the adoption of battery ignition (Delco) in place of a magneto, this having been done, it is stated, to assure more satisfactory slow running. An enclosed vertical shaft, driven off the eccentric shaft, drives the distributor which is slightly higher than the top of the cylinder, the head of which is covered by a detachable aluminum plate. The electric wiring passes under this plate, to the plugs, leaving only a very short length exposed.

A dual Zenith carburetor is fitted direct to the cylinder casting and is fed from a 13-gal. gas tank under the cowl. Lubrication is under pressure to the three main bearings and through the hollow shaft to the connecting rod bearings, which are white metalled and have two bolts for the bearing caps. Alpac metal is used for the pistons which have very big diameter hollow pins fixed in the piston bosses. Cast iron is used for the sleeves, but it is understood that Voisin is preparing to change over to steel sleeves of a special type. A combined electric generator and starting motor, of Voisin design, is mounted on the



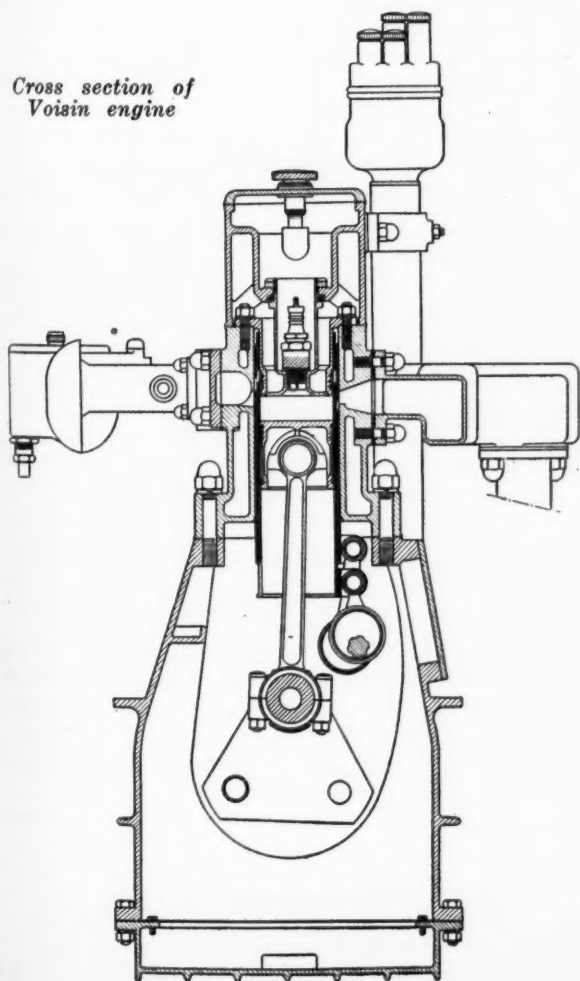
Section through transmission of Voisin six-cylinder car

nose of the crankshaft and can be almost completely dismounted without the use of tools.

Engine, clutch and gearbox are a single unit, with a bell housing in front and two point attachment to the side rails at the rear. The transmission provides three speeds ahead and reverse, with a spiral bevel type rear axle and an enclosed propeller shaft, the casing having a spherical attachment to the rear of the gearbox.

The brakes are on the four wheels and are operated by pedal through a Dewandre servo mechanism, the cylinder of which is under the hood, on the right hand side of the engine, just behind the radiator. Brakes are of the Perrot type.

Cross section of
Voisin engine



Gregg Superchargers

TWO types of superchargers for racing engines, marine engines, etc., are being manufactured by the Green Engineering Works of Dayton, O., from designs of David Gregg. One of these, of the centrifugal type, is intended specially for Ford cars for racing on dirt tracks.

The impeller of this supercharger is driven through self-contained gearing to turn at seven times crankshaft speed and is said to force air into the cylinders under an over-pressure of 6-7 lb. p. sq. in. In addition to forcing more air and fuel into the engine cylinders, the supercharger more thoroughly mixes the fuel and air and eliminates losses due to unequal distribution.

Usually the supercharger is mounted at the front of the car and directly connected to the forward end of the crankshaft through a shaft with universal joints. The carburetor is connected to the supercharger inlet. Power control is by the carburetor throttle. It is claimed that with one of these superchargers an increase in output of about 30 per cent is possible.

The Roots blower type of supercharger is made of aluminum, except for the gears and shafts. The rotors are cast onto the shafts, and it is said to be impossible for them to come loose. The gears are made of chrome nickel steel, hardened and ground. Shafts are mounted on ball bearings and the supercharger is driven at engine speed. As with the centrifugal type, the carburetor is connected to the intake of the supercharger, and from the outlet of same a connection is made to the intake manifold of the engine. This supercharger is specially recommended by the manufacturers for use on marine engines.

Chemists Advance New Theory of Action of Anti-Knock Compounds

Tetraethyl lead, which is given highest value rating, said to decompose into metallic particles which spread through combustion chamber and act as centers for partial burning of fuel.

A NEW theory of the action of anti-detonating preparations is advanced in a report issued by the American Chemical Society concerning researches covering a large number of chemical compounds. These researches, which were carried on in the chemical laboratory of Ohio State University by William Hale Church, Edward Mack, Jr., and Cecil E. Boord, showed that compounds of lead are the best antidotes against knocking in automobile engines.

The new theory offered by the investigators attempts to explain the way in which tetraethyl lead prevents knocks: In the explosion which takes place in the engine, tetraethyl lead is decomposed suddenly into infinitesimal particles of metallic lead which act as centers for partial burning. These little particles themselves burn as the flame front approaches them and thus they make the flame travel faster than if they were not present. This condition is described as somewhat like millions of unimaginably small spark plugs that ignite the gas just ahead of the flame front.

"Thus by virtue of the multiple centers of high temperature created by the burning of these little particles of lead," says the report, "there is initiated evenly ahead of the main flame front a partial oxidation or an auxiliary burn tending to maintain combustion in a region of fuel which otherwise would be subject to detonation."

"The decomposition temperature of anti-knock materials, taken in conjunction with the temperature of the cylinder gases, thus determines at what stage in the cycle they shall begin to function. If the decomposition temperature is low, partial oxidation will begin earlier in the cycle and extend throughout a larger volume of unburned fuel than if it is high. In the extreme of the latter case, it would cause a lowering in the efficiency of the compound, while in the former it might cause slight pre-ignition."

"The ideal anti-knock compound should possess a decomposition temperature which will cause it to begin to function just with or just after ignition of the charge by the spark plug."

Five properties, according to the researchers, are essential to this anti-knock material. The first is volatility, with the boiling point under 400 deg. C. The second is that the amount of free metal liberated when the compound is heated in the air should be complete. The decomposition tempera-

ture should be between 200 and 300 deg. C. Temperatures developed by oxidation of the metal should be high compared to ignition temperature of the fuel. The particles should be of colloidal size to favor rapid oxidation.

The knock in an automobile engine, it is explained, is supposed to be due to the fact that burning of a part of the gas mixture so compresses the unburned portion that this unburned portion becomes hot enough to ignite spontaneously.

The little particles of lead distributed throughout the gas mixtures vastly increase the swiftness of the flame travel and make it possible for the flame to reach every part of the gas before it has had a chance to ignite spontaneously.

Values are Compared

Important to chemical science, it was said, was the finding by the investigators of a method of comparing one anti-knock with another. On the basis of this disclosure a table of values was constructed with tetraethyl lead as the basic compound. The researchers determined and classified all anti-knock compounds as well as compounds without effect in attacking knock in automobile engines.

Tetraethyl lead was found to be the most formidable of the anti-knock compounds, and all comparison was based upon a value of 100 attached to this compound as "the anti-knock coefficient."

Lead diphenyl dimethyl ranks second with a value of 97 and lead diphenyl diethyl third with 93.5. Lead diphenyl diiodide scored 80, lead diphenyl dichloride 72, and lead diphenyl dibromide 60.

Lowest in the scale of anti-knock compounds, the investigators discovered, was aluminum ethyl iodide, called "very weak owing to iodine content." Twenty-five compounds were classified in the report as anti-knock.

Thirty-four compounds proved to be worthless in suppressing knocks. These included gold chloride, platinum chloride and nitrogen sulfide.

"None of these compounds," said the report, "exerted the slightest effect in suppressing the intensity of the explosion. Diethyl selenide even appeared to increase the loudness of the reports."

"Less than 0.1 per cent of chromium pentaphenyl bromide would be dissolved in a fuel suitable for the test. This compound would be expected to exhibit anti-knock properties if larger concentration could be tested."

Comparative Values of Anti-Knock Compounds

(Based upon lead tetraethyl as 100)

Lead tetraethyl.....	100
Lead diphenyl dimethyl...	97
Lead diphenyl diethyl....	93.5
Lead diphenyl diiodide....	80
Lead diphenyl dichloride..	72
Lead diethyl dichloride...	67
Lead tri-p-xylyl.....	64.7
Lead diphenyl dibromide..	60
Lead tetraphenyl.....	59
Bismuth trimethyl.....	20.2
Bismuth triethyl.....	20.2
Bismuth triphenyl.....	18.2
Stannic iodide.....	12.8
Tin diethyl diiodide.....	12.3
Lead thioacetate.....	8.4
Lead ethyl xanthogenate..	7.1
Antimony triphenyl diiodide.....	4
Stannic chloride.....	3.5
Titanium tetrachloride....	2.7
Titanium tetraiodide.....	2.7
Triphenyl arsine.....	1.4
Cadmium dimethyl.....	1.05

EDITORIAL

Good Will

IT'S common practice today to count good will as a dollars and cents asset in the balance sheet. That means that it has a definite profit-making value to every automotive company.

Good will is built up, partly through major policies and activities of a concern, but largely through the thousands of small actions performed daily by its employees. The clerk at the desk in the reception room, the salesman, the purchasing agent, the office boy and the president all have hundreds of chances every week to build good will for an organization—or to destroy it.

William Feather estimates that \$10,000,000 in telegraph tolls is spent every year to pay the cost of the word "Please." He says that it gets results, and that the telegraph companies state that it is being increasingly used. That's just another example of the practical value of courtesy and good will building in modern business. Automotive companies and men should continue to be among the leaders in this line.

As a Banker Sees Us

IN the course of a talk about instalment buying at the meeting of the Chamber of Commerce of the United States last week, O. H. Cheney, vice-president of the American Exchange-Pacific National Bank, took occasion to flay automotive time sales methods with some vigor. He characterized present conditions as chaotic, said that the industry no longer is selling automobiles but instalment contracts instead, and insinuated that if the situation is as bad as it is in prosperous times, it was likely to be extremely bad if anything like a business recession should set in.

Mr. Cheney showed a thoroughly good knowledge of the existing facts about automotive instalment selling, but a part of his interpretation of those facts and the conclusions which he drew from them seem somewhat less accurate than the facts themselves.

Despite the too liberal extension of time sales terms—which we have pointed out on many occasions—the automotive retail financing situation is not in chaos. Confusion exists in some quarters, perhaps, but generally speaking the manufacturers, the finance companies and dealers understand both the dangers and advantages inherent in the various practices which exist and are working intelligently to conduct activities in an orderly way. A definite trend toward sounder processes, exhibited strongly in statements from responsible representatives of all branches of the industry and to a growing extent in actual practice, has been going forward for several months. Confusion there has been—but not chaos.

Again Mr. Cheney exceeds the bounds of accuracy

in statement when he says that instalment contracts rather than automobiles are being sold today. The power of excessive as compared with sound instalment terms as a sales asset abides chiefly in the minds of the finance company salesmen who are trying to sell dealers on their particular form of liberality. The number of car sales actually made or lost through excessive liberality or adherence to sound instalment terms certainly is insignificant and negligible as compared with the sales made or lost through the merits of the vehicle or the selling power of the dealer or salesman.

That the industry would suffer more in case of depression because of the very liberal financing terms that have been extended than it would had sounder terms been adhered to rigidly cannot be denied. How great the difference would be no one can gage quantitatively; but we agree with Mr. Cheney that it would be material.

The chief difference the industry will find with Mr. Cheney's remarks—part of which appear on other pages of this issue—will be in the inferences which the banker leaves to be drawn from his remarks rather than from disagreement with positive statements which were made, although in some instances, such as those mentioned, the disagreement must be direct.

Mr. Cheney's discussion as a whole shows a thorough understanding of the automotive financing problem and its relation to fundamental economics. As the opinion of an important banker about the retail financing methods of our industry, it merits close attention from automotive executives.

Stock Engines in Buses

IN 1924 the real development of the bus business got under way. At that time some 56 stock bus engine models were on the market, but only about 32 bus chassis models were using stock engines. About 24 stock bus engine models, in other words, were being offered for sale without having found a market.

Since that time the number of bus chassis models has increased materially, as has the number of bus chassis models using stock engines. The number of stock engine models offered for bus use has increased in the last three years, but at a less rapid rate than the chassis using stock engines.

Today stock bus engine models total about 66, but there are 80 bus chassis using stock engines.

Even the present condition, of course, indicates that some of the engine models are used on only one or two chassis models, but a very definite trend toward a growing market of considerable size for such engines is shown clearly by detailed analysis of the figures.

AUTOMOTIVE **NEWS SECTION** INDUSTRIES

Philadelphia, Pennsylvania

Thursday, May 20, 1926

Factory Operations Reflect Irregular Retail Movement

PHILADELPHIA, May 20—Although a few of the motor car factories have increased production slightly in the last two weeks, the majority are either maintaining schedules at levels previously established or are gradually curtailing. Current shipments by equipment makers are lower than they were a month or six weeks ago, clearly indicating retrenchment by the car manufacturers. At the same time, it cannot be ignored that rather heavy stocks of parts and semi-finished vehicles were accumulated during the early months of the year, and part of the shipments of the last month have involved a considerable reduction in inventories.

From now on output will be closely dependent upon the state of the retail market and stocks in dealers' hands. So far the spring selling season has been up to expectations in total volume, but not all manufacturers are sharing equally in the good market. The leaders in public popularity are selling at record levels.

Manufacturing conditions are on the whole extremely favorable. Raw material costs continue to decline, while prices thus far have been fairly stable. Rumors of price-cuts are persistent, but this is a more or less permanent condition in the automobile industry. As long as sales remain at high levels the possibilities of lower prices are not very strong.

In line with the seasonal trend, parts and accessories are being sold in larger quantities, even tires showing some evidence of spring stimulation. Trucks and buses are still experiencing a record demand, while the export market is better than ever. South America is particularly looked to as a field for heavy expansion of American export business, the Argentine having recently come into first place as a foreign market for American automotive products. Road-building, the chief need of the Latin-American countries, is proceeding at a rapid pace.

Electric Truck Makers

Exhibit at Convention

ATLANTIC CITY, May 19—Four manufacturers of electric trucks joined in an exhibit staged here in connection with the National Electric Light Association convention just held. It was the first exclusive electric truck showing ever held and was staged under the auspices of the Society for Electrical Development as part of its activity in promoting electric truck use. Models designed for public utility work were shown.

Companies participating in the exhibit were Commercial Truck Co., Philadelphia; C. B. Electric Trucks, Inc., New York; Walker Vehicle Co., Chicago, and Ward Vehicle Co., Mt. Vernon, N. Y.

Must Study America, Rosengart Declares

Says Industry's Strength is in Organization — Declares Peugeot Plant Coming

PARIS, May 8 (by mail)—"French automobile manufacturers must form a joint technical organization with the necessary funds to send its engineers and commercial chiefs to the United States to study American methods," declared Lucien Rosengart on his return.

M. Rosengart, who is vice-president of the Peugeot Automobile Co., maintains that France has a technical lead in automobile design, but the strength of the American automobile industry lies in the grouping of forces and the powerful financial assistance at its disposal. "If we can secure equally strong financial backing to enable us to organize on the same scale, the American peril will be swept away."

"America showed much interest in the small 5 hp. Peugeot automobile and plans are already laid for the construction of a factory of more than two million square feet for producing this model," says M. Rosengart.

There will be important American participation in the motor boat section of the Paris automobile show, according to promises he received. The vice-president of the Peugeot company maintains that there is an immediate market in the United States for 10,000 French motor boats; and to take advantage of this he has already formed an American branch of the Peugeot Motor Boat Company.

Car Shipments to France Down in First Two Months

PARIS, May 8 (by mail)—American automobile imports into France are down from 4066 to 395 for the first two months

of this year, compared with the corresponding period of last year, according to French Government returns. This is obviously incorrect, for it is known that the sales of American cars in France have been maintained.

The explanation appears to be that all Ford automobiles have not been counted as units but as parts, and as a consequence they figure under the heading "weight" but not as complete automobiles. The figure of 395 American automobiles imported into France during January and February is exclusive of Fords. It is understood that the April returns will be complete, for the French Government will estimate the number of Ford automobiles by the number of engines imported.

French automobile exports show a slight drop compared with 1925. The greatest volume of business was done with Belgium, Algeria coming a close second, Spain third and Great Britain being fourth in importance.

New Tax Regulations Go to Manufacturers

WASHINGTON, May 19—The new regulations relating to the tax on the sale of automobiles under the revenue act of 1926, which became effective on March 29, have just been announced by the U. S. Bureau of Internal Revenue and will be mailed this week to automobile, body and allied manufacturers for their guidance. The new regulations are known as "Revised Regulations 47, for 1926." Essential features include:

"The tax is imposed on the sale by the manufacturer and must be returned and paid by him, whether the sales price is actually collected or not. It is measured by the price for which the article is sold by the manufacturer, and not by the list price where that differs from the actual sales price. If the price of a taxable article is increased to cover the tax, and the article is sold at such price including the tax, the tax is on such increased price."

"On the other hand, the manufacturer may reimburse himself in the amount of the tax by quoting the selling price and the tax in separate and exact amounts, and where invoices are rendered, segregating these amounts on the invoices."

Mexican Show Opening Near

WASHINGTON, May 20—Mexico City is holding its first automobile show in four years under the auspices of the Mexico Automobile Club, the Automotive Division of the Department of Commerce is informed. The show will start on May 29 and will continue two weeks. All available space was taken by exhibitors far in advance of the actual show date.

New Canadian Tariff Upheld; Manufacturer's Defer Action

OTTAWA, May 19—The resolution of Hon. J. A. Robb, Canadian Minister of Finance, for the adoption of the budget, went to a division of the House of Commons today and carried by 121 votes to 108. The Liberals sitting in the Government benches were solidly supported by the Progressives, the latter being the free traders of the Canadian Parliament. The high protection Conservatives alone opposed the measure.

This means that the important reductions in the Canadian tariff on imports of automobiles and automobile parts made effective in the budget speech of April 15, are now confirmed. The subject has yet to come before the Canadian Senate, but the Upper Chamber will undoubtedly adopt the resolution.

American Imports Increasing

After the Commons vote, the result of which was not unexpected, there were no announcements by General Motors, Ford, Dodge, Willys-Overland, or other Canadian manufacturing companies regarding any new Canadian policies or further charges. Canadian automobile factories are operating, but car imports from the United States have increased.

The outstanding features of the new tariff are reductions in the rate on cars and trucks whose retail price is \$1200

or less, from 35 per cent to 20 per cent, and on cars whose retail price is above \$1200, from 35 to 27.5 per cent.

Under this tariff American companies maintaining Canadian car manufacturing subsidiaries have declared that it would be impossible to operate profitably in Canada and therefore Canadian manufacturing operations would be discontinued. Instead cars manufactured in United States plants would be shipped complete into the Canadian market.

No Change in Drawback

The drawback provisions of the tariff which permit a 25 per cent refund to manufacturers on cars built 50 per cent or over of Canadian materials and labor are unchanged. This feature favors only the Ford Motor Co. of Canada, Ltd., under the former method of manufacturing maintained by most American subsidiaries.

The tariff applies on the wholesale price of the vehicle plus the American excise tax. Savings to Canadian purchasers will be principally evident on cars which formerly were manufactured entirely in the United States. The Canadian purchaser in getting a somewhat lower priced vehicle must sacrifice former features such as special color finishes, and other details.

No Change in Essex Reads Chapin Wire

DETROIT, May 20—Roy D. Chapin, chairman of the board of Hudson Motor Car Co., denied that the company has any intention to either discontinue the manufacture of the Essex or to change its name, in an official statement wired this week to all Hudson-Essex distributors. The telegram read:

"Essex is our largest selling car. More than 300,000 are in service. Daily production has just been increased 50 per cent which will make the May output for the coach alone 2080 greater than the entire May output last year, then the record Essex month. Production of both the Hudson super-six and of the Essex six will be continued to keep them the outstanding values of their respective types.

Westinghouse Sales Set New All-Time Record

NEW YORK, May 19—The annual report of the Westinghouse Electric & Mfg. Co., shows that total sales for the year ended March 31 were \$166,006,800, the largest year volume of business in the company's history. Net income available for dividends was \$14,122,001 or 11.9 per cent on the total capital stocks of \$118,503,150. Cash on hand March 31 was

\$12,606,180 and surplus \$61,100,324. Current assets were \$137,336,122 and current liabilities \$18,432,073.

Delco Takes Remy Space to Increase Production

DETROIT, May 20—To increase facilities for manufacture of Delco ignition units, a number of departments engaged in manufacturing operations on these units will be moved to Anderson, Ind., where they will occupy space in Remy plants not hitherto used. The move is made solely in the interest of increasing Delco production facilities without building new plant additions, General Motors Corp. declares. There will be no consolidation of the two ignition manufacturing units, each maintaining entirely its corporate entity and their products also being maintained entirely distinct as formerly. The two ignition manufacturing units, however, will be under the general direction of C. E. Wilson, succeeding O. L. Harrison, who is to be assigned to other work within the corporation.

Chrysler "80" Pace-Maker

INDIANAPOLIS, May 17—Louis Chevrolet, former noted race driver, will lead the field across the tape for the start of the Indianapolis race in a Chrysler "80" roadster.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.

NEW YORK, May 20—Trade and industrial activity continues fairly high, although some further recessions in basic manufacturing operations were noted last week. Climatic conditions have not been entirely favorable, either for trade or agriculture. The level of wholesale commodity prices advanced last week, while stock quotations continued to exhibit some weakness.

FREIGHT CAR LOADINGS

Car loadings continued to increase during the week ended May 1, with a total of 995,641, which compares with 973,304 in the preceding week and 984,073 in the corresponding period last year. The total for the year to date is 16,777,076, as against 16,493,312 a year ago.

FOREIGN TRADE

The fourth consecutive import balance in the foreign trade of the United States occurred last month. According to the preliminary figures, exports amounted to \$388,000,000 and imports to \$398,000,000, making an import surplus of \$10,000,000, which brings the total excess of imports since the beginning of the year to \$134,000,000.

BANK DEBITS

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended May 12 were 16.9 per cent below the total for the preceding week but 5.9 per cent above that of a year ago.

FISHER'S INDEX

Fisher's index of wholesale commodity prices stood at 152.3 last week, as against 151.2 a week earlier and 151.6 four weeks earlier. The wholesale price index of the Bureau of Labor Statistics declined from 151.5 in March to 151.1 in April.

FEDERAL RESERVE STATEMENT

Bills and securities held by the Federal Reserve banks declined \$55,200,000 during the week ended May 12, with a decrease of \$70,800,000 in discounts partly offset by gains of \$14,800,000 in open market purchases and \$1,000,000 in Government securities. Deposits declined \$40,400,000, while note circulation increased \$3,500,000 and reserves \$16,200,000. The reserve ratio rose from 74.5 to 75.7 per cent.

During the same period, loans of reporting member banks declined \$43,000,000, with decreases of \$4,000,000 in loans secured by Government obligations, \$24,000,000 in loans secured by stocks and bonds and \$15,000,000 in "all other" loans. Investments increased \$76,000,000 and net demand deposits \$141,000,000, while borrowings from Federal Reserve banks declined \$71,000,000.

Employment Survey Shows Plants Busy

Industry Generally Holding
High Production and Seek-
ing Skilled Workers

WASHINGTON, May 20—High production schedules prevail generally in the automobile factories and automobile accessory plants of the country with full quotas employed, it is revealed in the current issue of the Industrial Employment Information Bulletin containing an analysis of reports received by the U. S. Employment Service for the month of May. Reports from Michigan, the principal automotive center particularly are encouraging in that they state "there is a strong demand for highly skilled mechanics in the automobile industry with many automobile plants working overtime."

Following are concise reports from the leading automotive centers:

New York: Automobile assembly and accessory plants, also repair shops, are taking on a large number of automobile mechanics and body painters. At Buffalo automobile plants are running with labor well employed and the prospects in this line for the next 30 days are very promising. At Rochester automobile body, accessory, and repair shops are maintaining a high rate of activity and employment in these lines increased during the past 30 days.

New Jersey: Automobile plants and repair shops are taking on more workers. The rubber industries at Trenton are operating at about 75 per cent of capacity, but a marked decrease in employment occurred during the past month.

Pennsylvania: Automobile and accessory plants are operating, with labor well employed. At Williamsport a motor industry is working overtime and will continue this schedule for the next three months; skilled mechanics are needed in this line.

Indianapolis: Activity in the automobile industry is undergoing a slow, but definite expansion, likely to continue for at least two months.

Michigan: There is a strong demand for highly skilled mechanics in the automobile industry. In Detroit there is a slight shortage of skilled mechanics, particularly among automobile factory workers. In Flint all automobile plants are working overtime in some of their departments.

Ohio: The automobile industry is swinging into high production schedules. In Columbus some automobile plants are working overtime and will continue for 60 days. In Toledo the automobile industry increased forces and operating time.

To Build Cuban Highway

WASHINGTON, May 15—Contracts for the construction of the Central Highway in Cuba will be awarded during August with promise made that advertisements for bids soon will be published, the Automotive Division of the Department of Commerce is advised through a dispatch from Acting Commercial Attache R. M. Connell at Havana. It is stated that bids are to be made on a unit cost basis.

G. M. C. SALES SHOW LOW DEALER STOCKS

NEW YORK, May 15—Sales to owners and sales to dealers by the car and truck divisions of General Motors Corp. for the first four months of 1926, and for the same months in the two previous years, are as follows:

	Dealers Sales to Users		
	1926	1925	1924
Jan.	53,698	25,593	33,574
Feb.	64,971	39,579	50,007
March	106,051	70,594	57,205
April	136,643	97,242	89,583
	361,363	233,008	230,369

	Division Sales to Dealers		
	1926	1925	1924
Jan.	76,332	30,642	61,398
Feb.	98,313	49,146	79,668
March	113,341	75,527	75,484
April	122,742	85,583	58,600
	410,728	240,898	275,150

These figures include passenger car and truck sales in the United States, Canada and Overseas by the Chevrolet, Pontiac, Oldsmobile, Oakland, Buick and Cadillac manufacturing divisions of General Motors.

Chevrolet Continues 70,000 Monthly Goal

DETROIT, May 15—During the first four months of 1926, the Chevrolet Motor Co. manufactured 233,683 cars. Despite the record, the factory reports retail sales far in excess of production, with thousands of unfilled orders on hand.

A new high production record was set in April, when 71,157 automobiles were built in the 24 working days, a daily average of 2964 cars. A total of 62,652 were for domestic use. Retail domestic sales for the month were 68,278, exceeding the domestic production quota by 5626.

The week ending May 1, set a new record for sales in a single week, when 17,628 automobiles were retailed.

The factory plans to build more than 70,000 cars a month, indicating a steady demand throughout the summer.

Pulitzer Race Off

DETROIT, May 14—Due to the lack of necessary appropriations for building new racing planes and the absence of foreign entries, the Pulitzer Trophy Race, the premier event of the International Air Races will not take place at this year's meeting to be held in Philadelphia. The dates for the air races to be held during the Sesqui-Centennial Exposition at Philadelphia will be September 4 to 11.

The new Curtiss racers taking part in last year's Pulitzer race will be modified and fitted with pontoons to defend the Schneider Cup Race to be held after the International Air Races.

Tire Sales Shortage Runs Near 5,000,000

Miller Executive Finds All
Stocks Low Considering Po-
tential Large Market

AKRON, May 17—There has been a shortage of sales of tires in the past six months of approximately 5,000,000, with manufacturers' stocks increased about 2,000,000, according to W. F. Pfeiffer, general manager of Miller Rubber Co., this condition being taken by Mr. Pfeiffer to indicate that there will be a large demand for tires in the near future with the possibility of a market shortage at the height of the season.

Following a two-months' trip Mr. Pfeiffer reported that there has been a general hesitation in buying on the part of dealers because of the crude rubber situation. Because of this dealer stocks are very low and are being kept low with the idea of being able to stock up at lower price levels.

Dollar-and-cent volume for Miller in the first quarter of the year was in excess of 25 per cent more than for the same period last year, he said, but there was a shrinkage in the sale of units. Unit sales for April, however, were equal to last April in spite of the fact that last April there was heavy buying against a price increase effective May 1.

Brunn Builds Small Car for Czechoslovak Market

WASHINGTON, May 20—A new car, which is to be nameless, but known only as the "Z" car, has just made its appearance in Czechoslovakia, the product of the Brunn Small Arms Factory, of Brunn, Czechoslovakia, according to advices sent the Automotive Division, U. S. Department of Commerce. The company plans to produce 250 cars this year. Prices range from \$1050 to \$1200. But one type of chassis is being produced, having 104 in. wheelbase and equipped with a 2-cylinder water-cooled engine which develops 18 hp. and a speed of approximately 80 kilometers per hour.

Auburn Near 1925 Total

AUBURN, IND., May 17—Market value of cars shipped by Auburn Automobile Co. in the first four months of this year totals \$7,549,000 as compared with \$2,119,000 in the same period of 1925, according to a statement by E. L. Cord, president. The company will ship as many cars in the first five months as in all 1925, Mr. Cord said. The company is behind on orders and retail sales are keeping pace with increased production, he said.

Hupp Adds "8" Roadster

DETROIT, May 20—A roadster body with a rumble seat is the latest body model on the eight-cylinder chassis of the Hupp Motor Car Corp. The price is announced as being \$2045.

Further Waste Check Sought in Industry

Department of Commerce to
Cooperate Forming New
Utilization Committee

WASHINGTON, May 20—Steps toward a more effective elimination of waste in the metal trades were taken at a conference held this week under the auspices of the Department when decision was reached to form a National Committee on Metals Utilization to supervise the elimination of waste in cooperation with the Department of Commerce.

Secretary of Commerce Hoover presided at the opening conference and spoke on the merits of the work to be undertaken. R. M. Hudson, chief of the department's Division of Simplified Practice, spoke of the achievements to date in reduction of variety and dimensions in the elimination of waste.

Representatives of the automotive industry present included: B. J. Kough, National Association of Farm Equipment Manufacturers, John Deere Plow Works; J. E. Linabury, National Automobile Chamber of Commerce, Works Managers Committee, General Motors Corp., and Alfred Reeves, National Automobile Chamber of Commerce, New York.

New Receiver Appointed for Lexington Company

INDIANAPOLIS, May 15—George M. Barnard, an Indianapolis attorney, was this week appointed receiver for the Lexington Motor Car Co. of Connerville by Judge Baltzell of the United States District Court to take the place of William P. Herod of Indianapolis, who has been receiver since the company went into the hands of the court more than two years ago.

Mr. Herod's resignation made last Saturday was accepted by the court before the appointment of Mr. Barnard. The court at the same time ordered that Mr. Herod and his surety, the Fidelity Casualty Co., be not discharged from accountability until a complete accounting is made showing all finances, assets and expenditures of the company since the receivership suit was filed.

Russian Air Line Resumed

NEW YORK, May 18—The German-Russian Air Transport Co., Berlin, resumed flights between Germany and Russia on May 1. The planes of the company leave Moscow and Königsberg daily at an early hour and reach their destination (Königsberg or Moscow) the same day. Through arrangement with the Air Hansa, connections are made with air service to Berlin, London and Paris, and at the other end to Odessa. It is now possible to make the trip from London to Moscow in 24 hours and from London to Odessa in 38 hours, as compared with 83 and 122 hours if the trips are made by train.

RUBBER "RUSH" HITS FILIPINO NATIVES

NEW YORK, May 8—It is reported here that a "rubber fever" has struck the Philippine Islands, marked by a rush southward to the rubber lands by hundreds of natives, headed for agricultural colonies reserved for them by the Philippine Bureau of Agriculture and provided with rubber seedlings which, according to a ruling of the Bureau of Labor, they must plant in addition to sugar cane and tobacco.

This ruling is described as part of the Philippine Government's plans to supply the American market with rubber without the aid of foreign capital. The recently established National Rubber Council is studying other plans. The Bureau of Public Works is understood to be considering the planting of rubber seeds along public roads, the seeds to be purchased partly by the Government and partly by the provincial authorities, with cultivation in charge of section road workers and tapping probably contracted by private parties. The Bureau of Prisons has submitted to the Governor General a plan for using prison labor in rubber cultivation and 300 convicts have been designated to attend to cultivation in the Iwahig region.

The three small plantations now operating produce less than 1000 tons a year but more than 1,500,000 acres are open for cultivation.

"At-Your-Door" Prices Meet Favor, Says Hudson

DETROIT, May 15—According to William J. McAneeny, vice-president and treasurer of the Hudson Motor Car Co., retail sales of Hudson and Essex cars reached the highest point in the company's history, in April.

Distributors, he said, reported sales to buyers totaling approximately 35,000 automobiles, a 30 per cent gain over March and 50 per cent over April, 1925.

The company anticipated its sales would be increased when the "at-your-door" policy was adopted in February, he declared, and the reception has been all that could be expected.

Coach Output Increased

DETROIT, May 15—Hudson Motor Car Co. is increasing the production of Essex coaches 50 per cent, O. H. McCornack, vice-president, announced, today. The May schedule calls for 16,675 Essex coaches, he said, which is 2080 more than the Essex production in May of a year ago, which at the time broke all records for volume.

A year ago, the line was merchandised by 3700 dealers, while this year the line is presented by more than 4800 dealers, it was declared.

Signal Lights Lower Rate of Accidents

Value as Traffic Speeders Best
Realized When Supported
by Pedestrians

NEW YORK, May 17—Automobile fatalities for the first quarter this year decreased 4 per cent below the first quarter last year. In cities of more than 100,000 population the decrease was from 1079 to 1034.

According to an investigation by the National Automobile Chamber of Commerce, signal lights are increasing vehicular capacity of cities and reducing the number of automobile accidents. Of the 36 cities reporting, 29 affirm that signal lights reduced the number of accidents, two believed that they have not and the other four made no comment; 26 reported that signal lights made increased traffic volume possible and five disagreed, although approving such lights as a safety measure.

In the opinion of city officials reporting, value of traffic signals can be fully realized only when the support of the citizen is given when he is on foot as well as at the wheel.

"Our country owes much," says George M. Graham, chairman of the traffic Planning and Safety Committee of the N.A.C.C., "to the pioneering work of safety councils, newspapers, automobile clubs, health departments, police departments and other groups who for some time past have realized that the development of scientific records on this situation is essential to sane procedure. Particularly are we indebted to the National Conference on Street and Highway Safety called by Secretary Hoover, which did so much to stimulate public interest in this subject."

Ford Sales Run Second, First Since Price Cut

SPOKANE, WASH., May 15—For the first time since Ford prices were reduced, sales of new Fords have failed to top the list of registrations in Spokane county, according to the monthly report by the Washington Automotive Trades Association. Chevrolet registrations for April were 114 and Ford 106. Sales of used Fords totaled 330 against 104 Chevrolets.

Total number of new cars sold was 627. Total number of new trucks 67. Used cars sold totaled 790 and used trucks 129.

B. & O. to Operate Buses

NEW YORK, May 17—Transportation of Baltimore & Ohio Railroad passengers from the Jersey City terminal of the company to New York will be carried out by motor buses after Sept. 1 when B. & O. trains no longer use the Pennsylvania terminal. A centrally located bus terminal will be established in New York to which and from which passengers will be carried by bus.

Automotive Steels Show Better Demand

Continuance of Fair Volume
Through Summer Expected
—Prices Rule Steady

NEW YORK, May 20—Steel mills appear to have a slightly better quota of automotive orders in hand this week than they did during the preceding one. Successive ups and downs are to be expected from now on, but there is every indication that automotive demand will make a better showing than that in many other lines where more incisive deflation over the summer months is looked for. There is much unevenness, however, in the present automotive demand.

Some parts makers who have been instructed to postpone shipments to their customers pending certain changes in the production department are naturally holding back steel orders while others are buying fairly liberally. Some Detroit passenger motor car manufacturers have increased specifications for automotive alloy steels while others are buying very gingerly. About the only change in the price situation that has taken place has been in merchant steel bars which have now softened to the extent of \$2 a ton, round tonnages now being held at \$1.90 cents as compared with 2 cents a fortnight ago.

So far this easing off in the raw material of cold-finished bars has not affected the price for the latter, 2.5 cents continuing to be the general quotation. Strip steel rollers are contracting for rerolling billets on a \$35, Pittsburgh, basis. While the sheet bar market continues nominally on a \$36, Pittsburgh, basis, non-integrated sheet rollers are holding back fresh commitments, apparently expecting that by June somewhat lower prices will materialize.

Buying of bolts and nuts is light. No change, whatever, is noted in the sheet market. Full-finished automobile sheets appear to be holding their own at the old price of 4.30 cents, Pittsburgh.

Pig Iron—For what little iron automotive melters are buying they pay \$19, valley, for No. 2 foundry. The market generally is dull, with little incentive for prices to move one way or the other.

Aluminum—The National Automobile Chamber of Commerce estimate of 1925 automotive consumption of only 58,000,000 pounds came as a surprise to the market. In 1924 the same authority estimated automotive consumption at 80,000,000 pounds and in 1923 at 91,514,000 pounds. No such sharp tapering off in aluminum consumption has been noted in the ordinary course of business between aluminum sellers and automotive consumers, and while it is known that the metal has found use in many diversified industries in recent years it is difficult to reconcile these figures with the steadily growing total aluminum consumption. The rate of imports continues good, and the domestic producer

is believed to be operating at very close to capacity. Prices remain unaltered.

Copper—Routine conditions prevail in the domestic demand. Labor troubles in Atlantic seaboard refineries portend slight increases in refining costs. Automotive brasses are fairly active.

Tin—Following hurried covering by consumers when the strike broke out in England, the demand has now slowed down. Market steady.

Lead—Storage battery makers are buying prompt lead, while deferred maturities are rather neglected. Market steady.

Worse Price Menace Seen in Fall Rubber

NEW YORK, May 18—Recent announcement that if the price of rubber averages below 42 cents during the current quarter, the quantity which may be exported from the British Colonies at the minimum duty, under the Stevenson plan, will be reduced from 100 to 80 per cent of "standard" production, is described by David M. Figart, raw rubber authority here, as "a new lease of life for rubber restriction."

Departure on Feb. 1 from the rule of 10 per cent increases or decreases in restriction Mr. Figart describes as creating a precedent under which any change can be made at any time. The possibility of a 20 per cent reduction on Aug. 1, he says, creates a serious situation for the consumer. The high priced rubber in American manufacturers' hands constitutes a grave danger to profits this year. Within a year the rubber price has fluctuated between 45 cents and \$1.23 per pound for a commodity which costs less than 25 cents a pound to land in consuming markets.

"The new rules under the Stevenson plan," says Mr. Figart, "make probable a repetition of 1925 conditions but in more aggravated form. Under that plan there is no means of escaping the violent fluctuations in rubber prices which are a constant menace to the existence, not to say the prosperity, of our manufacturers."

Upholds Cap Type Patent

LOS ANGELES, May 17—Kingsley-Miller Co. has been awarded a decision in United States District Court here in a suit brought against Laurence A. Sweet Mfg. Co. It is held under the decree that the design patent No. 60878, covering general type of radiator caps made under the trade name "Monogram," has been infringed and a permanent injunction is granted.

Sweet Company to Appeal

LOS ANGELES, May 17—Laurence A. Sweet Mfg. Co. reports injunction granted to the Kingsley-Miller Co. affects only obsolete models of its radiator caps and that present production type is unaffected. An appeal from the decision is planned to protect itself on models formerly manufactured.

June to See Upturn, Says M.A.M.A. Head

Entire Industry in Sound Condition—Sell on Quality,
Members Told

NEW YORK, May 20—Automobile production will again be on the upgrade in June after a recession in May, H. L. Horning, president of the Motor and Accessory Manufacturers Association, told members at the first of a series of local meetings held Tuesday in Cleveland. All branches of the industry were never in better condition, Mr. Horning said. About 75 members were present at the first meeting and engaged in a spirited discussion of the association's activities and the business situation.

Considerable attention was given to trade practices that are causing difficulties to makers of original equipment. Similar meetings, all having the object of making members of the association better acquainted with the various services and for receiving suggestions for amplified activities, were held this week in Detroit and Chicago.

The trend of car manufacture as seen by Mr. Horning is toward better rather than cheaper cars and he urged members to sell on a quality rather than on a price basis. Other tendencies, he declared, were toward the use of stabilized fuels that would give more power; toward less weight per horse power, and toward different and better transmissions.

Other speakers urged and insisted upon terms with manufacturers that would give the parts maker a fair chance to make a fair profit. One of the greatest problems of the time, it was pointed out, is to arrange production schedules satisfactorily in view of the reluctance of makers to give definite orders for periods far enough ahead.

The large attendance at the meeting and the enthusiastic manner in which the members participated in discussions made it plain that the plan of the management for sectional meetings had been favorably received.

Two-Car Ownership Urged in Advertising Appeal

DETROIT, May 19—Advertising managers of the National Automobile Chamber of Commerce met at the Hotel Statler here this week to discuss present day advertisements with a view to adopting methods and copy appeal for the future. In a talk to the meeting Alfred Reeves, general manager of the association, spoke of the possibility of developing two-car ownership through advertising appeal.

E. S. Jordan presided at the meeting. W. K. Towers, of Paige-Detroit Motor Car Co., and C. E. T. Scharps, of Chrysler Corp., discussed export advertising. Frederick Dickinson discussed problems of research.

Turkish Tariff Dims American Car Future

PHILADELPHIA, May 18—Increased tariffs on American imports into Turkey will become effective August 20 in the absence of a resumption of formal relations with that country by the United States, or failure of a renewal of the present extension of preferential rates. With higher tariffs in effect sale of American automotive products in that country will be practically terminated, as the preferential rates extended to European signatories of the Lausanne treaty enable European manufacturers to undersell.

The situation has created a very pessimistic outlook for American distributors in that country according to E. B. Howard who handles Buick and Chevrolet sales there. Though American cars have achieved a considerable degree of popularity, this is based primarily on price and any other reasons for their sale now existing will be lost sight of if their price is raised above foreign competitors.

Under the tariff as now set, preferential rates are fixed at five times the original tariff for nations with which Turkey has treaties, whereas other nations must pay eight times this rate. On a Chevrolet touring car the duty would be increased from \$152 to \$243, which would enable Fiat and Citroen to undersell. The original tariff was 2½ Turkish pounds per 100 kilos.

Star "Four" Coupe Added

NEW YORK, May 27—A Star coupe listing at \$675 and mounted on the standard 4-cylinder chassis has just been announced by Durant Motors, Inc. The body which is finished in Persian blue,

has a large luggage compartment in the rear deck. The top is of black Duratex and has black enamel landau irons with nickel trimmings. Fenders and splash boards are finished in black enamel. Gray-blue plush velour is used to upholster the interior. Standard equipment includes balloon tires, one-piece ventilating windshield and cowl ventilator.

Bassick and Carr Effect Distribution Arrangement

BOSTON, May 19—Carr Fastener Co. and Bassick Mfg. Co. have effected an arrangement whereby the latter obtains the rights to the Carr centralized chassis lubricating system and also to the Dot lubricator for sale to manufacturers of automotive road vehicles.

The Carr Fastener Co. has reserved to itself all rights to the sale of Dot lubricators to manufacturers and users of industrial machinery and the arrangement in no way affects its present arrangement with its distributing organization.

The Dot lubricator will continue to be manufactured by the Carr Company and sold by its distributors in whatever fields they may develop.

Charlotte-Ford Inactive

CHARLOTTE, N. C., May 17—Only 786 carloads of automotive freight were moved in or out of Charlotte in the month of April, according to railways' reports compiled and made public by the Charlotte Shippers and Manufacturers Association. That total compared with 1317 carloads moved in April, 1925, and 936 carloads moved in March, this year.

The decrease in the shipments reflects to some extent the decrease in activities at the Charlotte assembly plant of the Ford Motor Co.

Montreal to Draw Record A.E.A. Group

CHICAGO, May 17—With reservations on file from more than 1000 members and guests the Automotive Equipment Association is rapidly completing plans for what probably will be its largest and most successful summer meeting at Montreal, June 14 to 19. The program as now outlined gives more time to the discussion of jobbers' problems than has been given in any previous meetings. At the same time the manufacturing members will find that the program gives full consideration to their problems.

Three general sessions of the association membership are scheduled. The first will be at 10 a. m. Wednesday, the second at 9.30 a. m. Thursday and the third at 10 a. m. Saturday. The Thursday general session will be devoted to the merchandising department under the direction of Arthur R. Mogge.

On Friday morning while the jobbers are holding their divisional meeting there will be a divisional meeting of the manufacturers with Commissioner Webster presiding.

An indication of the interest being shown in this meeting is found in the fact that 40 applications for membership are on file for consideration at this convention. These applications are about equally divided between manufacturers and jobbers.

Increase Trailer Output

EDGERTON, WIS., May 17—Highway Trailer Co. will double the capacity of its fabricating and assembly departments through the addition of a new factory building. Business is reported as increasing rapidly.

Developments of the Week in Leading Motor Stocks

NEW YORK, May 20—Continued heavy selling of the motor stocks featured trading on the New York Stock Exchange during the past week. In many issues new low prices for the year were recorded and the long pull trend was obviously downward.

Repeated attacks on Hudson Motor were successful in carrying quotations down to 56 which compared with a high price for the stock during the bull movement of 139½. There were no new developments in the Hudson situation to account for the weakness other than a steady liquidation of speculative accounts. The company has apparently adjusted its output in line with retail demand for its products and has been operating at a somewhat higher level.

Dodge was another weak feature declining to a price around 21½ or close to the level at which the stock made its debut shortly after Dillon, Read & Co. recapitalized the company.

That most of the weakness in these is-

suues was due to professional tactics which have found the motor section susceptible to selling raids, was clearly indicated by the attempted drive against Nash Motors, but in this particular issue the professional element had more than weak margin traders to deal with. Thousands of shares were dumped on the market in an effort to break the stock below 52 which has been its support point for some weeks back. Powerful banking interests supported the stock at this level, taking all offers, and with the discovery of this support the professional raiders quickly covered at higher prices. General Motors also resisted all attempts to force a decline. Stimulating news of the high rate of the company's operations, its record profits, coupled with the extra dividend of \$4 a share were the supporting factors in General Motors. While the stock failed to respond with an advance following the declaration of the dividend, many observers were impressed by the fact that it held firmly

around 125 despite the weakness in other sections of the list.

Bankers as a whole continue bearish on the motor stocks, and barring a technical rally, are predicting still lower prices for the group. While many issues appear to be selling at attractive levels in view of the dividend payments and earnings, it is pointed out that a tremendous speculative following has been built up in these stocks by the sensational advances scored last year. In many instances, motor stocks at their high prices have been attracted from the strong boxes of investors and are now a part of the floating supply with which the speculative community deals. As trade developments are not likely to be as bullish in the next few months as they have been recently, it would not be surprising if the motors continued to drift to the bargain counter, where the shrewd investors will again be taking them out of the market for their intrinsic worth.—E. S.

Extend Plane-Tour to Permit Displays

Reliability Contestants Will
Visit Fourteen Cities in
2270-Mile Trip

DETROIT, May 15—Tentative arrangements for the 1926 Commercial Airplane Reliability Tour for the Edsel Ford Trophy have been completed. According to announcement by W. B. Mara, chairman of the General Committee for the Tour, the Second Annual Reliability Test will start Aug. 14 and end Aug. 28.

This year's tour will cover a period of two weeks instead of one week, to give the plane manufacturers more time to display their products at the various stopping places on the route. The tentative calling points this year will be Detroit, Chicago, Milwaukee, Twin Cities, Des Moines, Omaha, St. Joseph, Wichita, Kansas City, St. Louis, Indianapolis, Cincinnati, Fort Wayne, Detroit. The total distance is approximately 2270 miles.

It is so arranged that the end of the tour will give contestants sufficient time to send their machines to the National Air Races at Philadelphia scheduled for Sept. 4-11.

Arrangements are being made to make provision for the naming of one plane as the winner of the tour, three successive victories by a plane of the same manufacturer gaining permanent possession of the trophy.

Light Motorcycle Gains Export Market Favor

WASHINGTON, May 20—Exports of motorcycles from the United States during the first three months of this year increased 17 per cent over those for the same period of 1925, the Automotive Division of the Commerce Department announces. This percentage, compared with a gain of 13.2 per cent in Great Britain's exports over like periods, and a 35.4 and 24, respective, United States and Great Britain percentage increases during the whole of 1925 over the preceding year, would indicate that American motorcycle producers are holding a stronger foreign position than has been thought.

The strengthening in American motorcycle exports, according to the Automotive Division, may be attributed to a large extent to the advent of the light American machine in world markets.

Gasoline Stocks Gain

WASHINGTON, May 15—Gasoline production in the United States during March totalled 969,543,000 gallons, a daily average of 31,276,000 gallons, or an increase of 436,000 gallons per day or 1.4 per cent over the February rate, according to figures just announced by the U. S. Bureau of Mines. Domestic consumption of gasoline amounted to 779,571,000 gallons, a daily average of 25,147,000 gallons, or an increase of 8

per cent over the preceding month and of 25 per cent over March, 1925 consumption.

Stocks on hand at the end of March totalled 1,936,336,000 gallons, being an increase of 78,000,000 gallons over the February stocks. Based on normal consumption, the current gasoline stock represents 73 days' supply.

New British Dirigible Carries 140 Passengers

WASHINGTON, May 20—Great Britain started work during the month of April on a second large airship of 5,000,000 cubic feet capacity, the Navy Department is informed. One of the features of the new ship is that the control and observation posts and the passenger accommodations will be built in the hull instead of being suspended from it. Her capacity will be accommodations for 140 passengers with luggage allowance. She will have a lift of 90 tons, a length of 760 feet and a beam of 130 feet. The engines will be of a new type capable of developing a cruising speed of 50 miles an hour, with a maximum of 70 miles an hour.

Practical Public Plane Sought in British Test

LONDON, May 8 (by mail)—Between Sept. 12 and 17 next a competition for two-seated light airplanes will be held in England to stimulate the production of a practical and economical machine for the private owner. The only restrictions upon individual ideas in design are that the machine shall have dual control, be houseable in a shed 10 feet wide by 10 feet high, and that its power unit shall not weigh more than 170 lb. A load, exclusive of fuel and oil, but including pilot and passenger, of not less than 340 lb. must be carried, and, starting each day from Lympne aerodrome, the competitors must, between the dates mentioned, have covered about 2000 miles on a series of out-and-home courses at an average speed of not less than 50 miles an hour. Each day's flight must be completed between 8 A. M. and 8 P. M.

Douglas Plane Bid Wins

WASHINGTON, May 15—Contract for the construction of 40 airplanes, to be used in trans-Continental air mail service was let by the Post Office Department this week, the successful bidder being the Douglas Co. of Santa Monica, Cal. The planes are to be delivered in 160 days, and will cost \$11,900 each. Five companies bid on the contract, the highest bid being that of the Curtiss Aeroplane & Motor Co., of Buffalo, for \$14,000.

Stewart Changes Title

CHICAGO, May 15—The name of the Stewart Manufacturing Co. has been changed to the Stewart Die Casting Corp., the business continuing as formerly with no other change.

Guggenheim Director Shows Air Progress

Metropolitan Section Hears
Group of Speakers at Annual
Aviation Session

NEW YORK, May 20—The present status of the commercial airplane was discussed by Professor Alexander Klemin, director of the Daniel Guggenheim School of Aeronautics of New York University, at the Aviation Meeting of the Metropolitan Section, Society of Automotive Engineers.

Professor Klemin described various types of air service and the performance, load characteristics and design of airplanes.

J. E. Whitbeck, vice-president and aeronautical engineer for W. E. Arthur & Co., and formerly superintendent of airplanes and airways for the U. S. Air Mail Service, discussed the organization, layout and equipment of airports, airways and flying fields.

Lieut. H. S. Kendall, U. S. N., in charge of Naval Reserve Aviation Training, Third Naval Division, New York, described aviation in the navy and a motion picture, "Wings of the Fleet," was shown.

The meeting was held at Cafe Boulevard because the dining room at the Building Trades Club has been outgrown. Average attendance during the season now closing was 166 against 87 last season.

The members received a questionnaire, the replies to which will guide the papers committee in working out meeting programs for next season.

C. B. Veal is chairman of this committee, assisted by W. E. Kent, A. D. T. Libby, R. E. Plimpton, G. A. Round and T. C. Smith.

The new officers for the year beginning tonight are: F. R. Glynn, chairman; C. B. Veal, vice-chairman; E. F. Lowe, treasurer, and H. M. Rugg, secretary. Neil MacCull, retiring chairman, becomes head of the reception committee.

The Metropolitan section membership is now 624, with Detroit's 743 leading the 12 sections throughout the country.

Michelin Buys China Tract

WASHINGTON, May 18—The French Michelin Tire Co. has purchased a tract of 120,000 acres in the rubber belt in Cochinchina, China, the Department of Commerce was advised this week. Officials look upon this purchase as a move on the part of the French company to help break the British rubber domination.

Silver Indian Jubilee

SPRINGFIELD, MASS., May 17—Celebrating the silver jubilee anniversary of its establishment in the motorcycle manufacturing field, Indian Motorcycle Co. cites the progress that has been made in this branch of the industry and notes an increasing usage of motorcycles in the commercial field.

"Getting Work Done" Made Fisher Success

Valuation of \$83,500,000 for
Minority Interest Built
from \$50,000 Start

NEW YORK, May 17—An approximate \$83,500,000 in General Motors Corp. stock will be paid for the minority interest in Fisher Body Corp. under the terms of the purchase officially disclosed at the directors' meeting Thursday. In acquiring control of Fisher Body in 1919, General Motors paid \$27,600,000 for 60 per cent of the stock; the then existing 200,000 shares being increased to 500,000, General Motors buying the newly issued 300,000 shares at \$92 per share.

Since the purchase of control of the body company in 1919, it has become at the present time an organization manufacturing almost solely for General Motors car producing divisions, though some body manufacturing is done for independent car builders, and a considerable volume of business is done with independents by subsidiaries of Fisher, notably Ternstedt Mfg. Co., manufacturers of body hardware, metal stampings and other parts.

In the years since the formation of the original Fisher Body Co. in July, 1908, the company has manufactured bodies for practically every large car producer that the industry has known. In recent years it has seen the demand for automobiles swing almost overnight from the former popular open vehicles to the enclosed types and it was among the first if not the first to sense the extent to which this demand for closed bodies would grow and to make provisions for meeting it.

Body Demand Swamps Plants

Its facilities for manufacturing and for getting work out on time won for it its place of outstanding preeminence in the body manufacturing field. Not longer back than 1917-20 closed body demand was increasing to such an extent that manufacturers were swamped with all the business they could or would take. By anticipating the period of this extraordinary demand Fisher Body was in position to take far more of this business than any other body builder and to profit by it.

In this period particularly it rose to its greatest dominance in the body field, its customers including practically every well known manufacturer. The production marks of the company made then have been eclipsed many times since and it has grown to far greater magnitude and strength, but it was in those days that it was manufacturing for the greatest number of customers. To a large extent the number of closed cars sold in that period depended upon the number of closed bodies that Fisher could build.

The diminishing of its general clientele since that period has been due largely to

the undertaking of closed body manufacture by many of the principal car builders who formerly had been customers. Including among these were Ford, Studebaker and Hudson. Manufacture of open bodies had previously been undertaken by practically all car builders, and body companies were building only a few special open types in conjunction with their mass production on closed types.

New Finishes Change Industry

Changes in methods of body finishing made possible to large degree this taking over of closed body work by car manufacturers. Application of quick drying finishes made possible large production without tremendous plant facilities. The Fisher company was enabled through the development of these finishes to increase its production to many times its former volume, the loss of independent customers being made up for by the tremendous gains in closed body demand from General Motors units.

The total absorption of the company by General Motors now practically consummated was largely forecast. Within the past two years leading members of the Fisher family have lessened or relinquished active work in the body company to take over executive positions in the parent company. Fred J. Fisher is a vice-president, a director and a member of the executive and finance committees; Lawrence P. Fisher is a vice-president, director and member of the executive committee, and Charles T. Fisher is a member of the executive committee and a director. L. P. Fisher is also president of the Cadillac division and is largely credited with the increased success of this company in the past year.

Develops From \$50,000 Start

The Fisher corporation as it stands today with a market valuation of close to \$200,000,000 represents the matured development of an idea conceived by Fred J. and Charles T. Fisher in 1908 when the original company was founded with a capital of \$50,000. Steps in the development were the formation of the Fisher Closed Body Co. in December, 1910, the Fisher Body Co. of Canada, Ltd., in April, 1912, the Fisher Body Ohio Co. in October, 1919, and the acquisitions of the Ternstedt Mfg. Co., the National Plate Glass Co., and other lesser companies.

Fisher Board Accepts Offer

DETROIT, May 15—Directors of Fisher Body Corp. voted this week to accept the proposal of General Motors Corp. for the acquisition of the minority interest in Fisher Body. A special meeting of stock holders has been called for June 3 at which time final action will be taken on the proposal.

Lyons Buys Witherbee

PHILADELPHIA, May 15—The Lyons Battery Co., of Philadelphia, has bought Witherbee Battery Co. and will transfer its manufacturing to the Witherbee plant on Long Island.

Financial Notes

Omnibus Corp., for the year ending Dec. 31, 1925, reports consolidated net income of \$793,011 after expenses and interest, equivalent after 8 per cent preferred dividends to 14 cents a share earned on outstanding 595,210 no par common shares. This compares with \$554,138 or \$6.28 a share on \$8,817,239 preferred stock in 1924. Fifth Avenue Bus Securities Corp., a subsidiary, reports for the year ended Dec. 31, 1925, net income of \$379,995 after expenses and taxes. This is equivalent to 64 cents a share earned on 590,129 no par shares, and compares with \$302,501, or 51 cents a share on 589,450 outstanding shares in 1924.

Allis-Chalmers Co., for the quarter ended March 31, 1926, reports net profit of \$828,401 after depreciation, Federal taxes, etc., equivalent after 7 per cent preferred dividend requirements to \$2 a share on \$25,770,750 common stock. This compares with \$914,185, or \$2.43 a share in the preceding quarter, and \$847,053 or \$2.17 a share in the first quarter. On March 31 unfilled orders on hand amounted to \$10,787,000, compared with \$10,147,072 on Dec. 31, and \$10,146,675 on March 31, 1925.

India Tire & Rubber Co. directors on May 12 declared a 62½ cents dividend on new common stock. Early in April this was split from old common, five shares being given for one. Dividend is payable July 1 to stockholders of record June 21. The company also declared the regular 1½ per cent dividend on preferred, payable on same dates.

Hood Rubber Co. has declared regular quarterly dividend of \$1, payable June 30 to stockholders of record June 19.

E. I. duPont DeNemours & Co. has declared an extra dividend of \$4 a share on its common stock in addition to the regular quarterly dividend of \$2.50 on common and 1½ per cent on its debenture stocks.

Gabriel Snubber Mfg. Co. has declared an extra dividend of 62½ cents on its Class A and B stocks in addition to the regular quarterly dividends of the same amount.

Doehler Die Casting Co. reports net earnings of \$157,972 for the first quarter of 1926 which compares with earnings of \$56,141 in the same quarter last year.

Black & Decker Advances Bond Payment 4½ Years

BALTIMORE, May 19—S. D. Black, president of the Black & Decker Mfg. Co., announces that all outstanding first mortgage bonds remaining from the company's bond issue, Dec. 1, 1920, payable in ten years, are now being called for payment June 1. The fact that these bonds are being paid off four years and a half in advance of maturity is an indication of the rapid growth and sound financial standing of the company, he said.

Within the last 30 days the concern purchased 30,000 sq. ft. of property in Oakland, Cal., and let a contract for the erection of a building to be used as Pacific Coast sales headquarters and for service and warehousing.

Men of the Industry and What They Are Doing

Holt Succeeds Palmerton as Rubber Division Chief

Paul L. Palmerton, for the past five years chief of the Rubber Division of the Bureau of Foreign and Domestic Commerce of the Department of Commerce has resigned to head his own company which will continue publication of "Rubber Age," it is announced by Dr. Julius Klein, director of the bureau.

E. G. Holt, assistant chief, has been designated acting chief of the Rubber Division succeeding Mr. Palmerton. Mr. Holt has been assistant chief for four years, having specialized on service to American exporters of rubber goods.

Mr. Palmerton, before entering the Bureau of Foreign and Domestic Commerce was connected with the Goodyear Tire & Rubber Co., Akron, where he engaged in sales promotion work and in research and market development. He also was manager of the Foreign Trade Bureau of the Rubber Association of America, New York, where he specialized in export services and foreign market promotion work.

G. M. Export Men Change

Changes in assignments of General Motors Export Co. personnel find G. R. Munro, formerly stationed at Antwerp with General Motors Continental, transferred to General Motors France as assistant manager; E. de Miranda at San Jose, Costa Rica, to be field representative in Central America, Venezuela, the Guianas, Curacao and Trinidad; E. S. Zack, formerly assistant to the general manager of General Motors Export Co., after visiting General Motors European operations, enroute to Melbourne where he will have charge of financial and operating control matters on the staff of the regional director; J. C. Graffin in the Pan-American division; H. H. Metzger named treasurer of General Motors, New Zealand; F. N. Adgate, formerly at Sao Paulo, now at the Detroit office, and G. J. Mack in the New York sales division of the company.

North East Names Officers

The appointment of D. P. Cartwright as service manager and Warren K. Lee as sales manager of North East Service, Inc., Rochester, has been announced. Mr. Cartwright, formerly branch manager at New York, recently returned from a special trip through the Orient. Mr. Lee was Detroit branch manager for eight years. W. C. Edwards, assistant branch manager at Chicago, succeeds Mr. Lee at Detroit.

Alford Stays on Council

Judge W. H. Alford, vice-president and comptroller of the Nash Motors Co., has been reelected president of the Kenosha city council, which operates under the city manager plan, for a fifth term.

WINNING ESSAYISTS INDUSTRY'S GUESTS

Winners of the National Highway Safety Contest, fostered by the National Automobile Chamber of Commerce and the U. S. Bureau of Education, this week were guests of honor in Washington of these two organizations, being feted by President Coolidge and lesser dignitaries as part of their compensation for being the best essayists out of 400,000 contestants on safety on national highways.

First prize was awarded to Dorothy Jean Utley, fourteen, of Bemidji, Minn., second to Harold Haswell of New York City, while the teacher's prize, for the best safety lesson, was awarded to Miss Elsie Green of this city.

The trio, accompanied by representatives of various automobile associations, were presented to President Coolidge by Captain Eddie Rickenbacker, World War ace.

Bowser Officers Continue

H. J. Grosvenor, vice-president in charge of manufacturing of the S. F. Bowser Co., has been elected to the board of directors. S. F. Bowser was re-elected chairman of the board; S. F. Bechtel was renamed president; H. J. Grosvenor, vice-president; L. E. Porter, treasurer; W. A. Bersch, comptroller; W. J. Vessy, general counsel, and E. D. Eggiman, secretary.

Carl L. Hobrock, district manager of the Milwaukee office, has been appointed industrial sales promotion manager.

Echols, du Pont Treasurer

A. B. Echols has been elected treasurer of E. I. du Pont de Nemours & Co., to fill the vacancy created by the resignation of Vice-president W. S. Carpenter, Jr., who also was treasurer. Mr. Carpenter has been made vice-chairman of the executive committee and designated vice-president in charge of finances.

Coggins in Sales Field

Edward J. Coggins, who for four years has been credit manager, has joined the sales division of Eisemann Magneto Corp. and will cover southeastern territory. Stephen M. Cargill, Jr., formerly a credit investigator for the R. G. Dun Agency, is now credit manager.

Stewart Zone Sales Head

L. I. Stewart, who formerly was plant manager for Chevrolet at Janesville, Wis., being succeeded Jan. 1 by Ellery L. Wright, has been appointed sales manager of the Pittsburgh zone, succeeding Felix Dorn, who on May 1 was given charge of the Dallas, Texas zone.

Carlisle Becomes Head of Goodyear of Canada

C. H. Carlisle, formerly vice-president of Goodyear Tire & Rubber Co. of Canada, Ltd., has been elected president to succeed E. G. Wilmer resigned. C. B. McNaught has been named vice-president to fill the vacancy. Mr. Wilmer will continue as a director.

Fred G. Rumball Promoted

Fred G. Rumball, formerly branch manager of the Kansas City branch of the Timken Roller Bearing Service & Sales Co., has been promoted to the position of sales engineer, automotive division, of the Timken Roller Bearing Co. Mr. Rumball will have his headquarters at Cleveland with Edgeley W. Austin, assistant manager of sales. Mr. Rumball first joined the Timken Detroit Axle Co., later holding several branch office positions with the bearing service and sales company. The position of Kansas City branch manager, will be filled by J. M. Carey. T. F. Rose, formerly assistant manager of the Chicago branch has been appointed manager of the Cincinnati branch. H. C. Sauer has been appointed manager of the Detroit branch.

Misch Service Manager

Albert F. Misch, who for 25 years has been connected with the Peerless organization, has been appointed service manager, according to an announcement by Edward Ver Linden, president of the Peerless Motor Car Corp. He will co-operate closely with the service departments of the dealer organization.

Prather Joins India Tire

C. C. Prather, for the last ten years with Goodyear Tire & Rubber Co., joined India Tire & Rubber Co., of Akron, as divisional sales manager, on May 10.

Mr. Prather entered the service department of Goodyear in 1916 and has held many important positions.

Harrington With General

Frank P. Harrington has been appointed manager of repair material and accessory sales by the General Tire & Rubber Co., with headquarters at the main factories, Akron.

Whiting with Van Norman

C. H. Whiting, formerly methods engineer for DeJon Electric Corp., Poughkeepsie, has been appointed Detroit representative for Van Norman Machine Tool Co. of Springfield, Mass.

F. C. Smith Honored

F. C. Smith, chief chemist at the International Harvester Co., Fort Wayne plant, has been elected secretary of the Fort Wayne group of the American Society for Steel Testing.

Duesenberg to Start Wider Distribution

Names New Sales Manager to Promote Plans for General Representation

INDIANAPOLIS, May 15—Important developments in the production and merchandising of Duesenberg cars were forecast yesterday by Fred S. Duesenberg, president of Duesenberg Motors Co., coincident with his announcement of the appointment of Douglas Andrews, formerly of the Stutz sales organization and other prominent makers, as sales manager for the Duesenberg. Mr. Andrews assumed his duties Monday of this week and is developing a plan of distribution which is expected to give the noted car a much wider sale in many parts of the country. In making the announcement Mr. Duesenberg said:

"For years we have been developing the engineering and production principles back of the Duesenberg motors. We are now ready to start a program of distribution which we hope will insure an adequate representation in every leading center in the country and in foreign fields as well."

It is understood here that Duesenberg has been planning important developments for some time, and the concern is now in position to undertake important expansion plans for which preparations have been in the making. Production so far this year has been good at the plant with a bank of back orders keeping the plant at a sound rate for several months past.

Oakland Roadster Sales Run 15 Per Cent of Total

PONTIAC, May 15—Fifteen per cent of the total Oakland production of Oakland Motor Car Co. is now being devoted to the sport roadster introduced at the national shows this year. From January to May 15 production on this model will reach 3633 and the factory reports many orders ahead. During 1925 combined sales of the Oakland roadster and former sport roadster model averaged 5 per cent of the output.

Oakland and Pontiac deliveries to dealers in April totaled 13,358, which compares with the March total of 12,019. Sales of the Oakland line in the first four months are approximately double those for the same period last year.

Foreign shipments of the Pontiac began in April. Foreign shipments on Oakland are approximating 400 monthly.

To Start Sebring Plant

SEBRING, OHIO, May 10—C. O. Tice, a production man of wide experience, will be factory manager of the McKinley Rubber Co. when it begins operations at the plant here. The factory formerly was the Sebring Tire & Rubber Co. Production will start just as soon as the necessary machinery can be installed.

COULDN'T ADVERTISE, KURTZ CAR PASSES

CLEVELAND, May 15—The Kurtz Motor Car Co., which built an automobile featuring an automatic gear shift control invented by C. B. Kurtz, president, has gone out of business.

Its business was confined practically to the Cleveland district where the car was made.

The company did not have enough money to advertise its car and therefore could not sell outside this district, said Mr. Kurtz, in filing a voluntary petition in bankruptcy in Federal court.

The company was incorporated in 1921 at \$525,000.

Its assets are listed at \$60,447.70. Liabilities are \$129,525.27.

St. Louis Finance Firms Push Repossession Sales

ST. LOUIS, May 15—Automobile finance companies in St. Louis are opening used car sales rooms to dispose of cars which they have repossessed, thus becoming competitors of automobile dealers in the used car field. Four such sales rooms have been opened here recently.

Members of the St. Louis Automobile Dealers Association in a recent meeting took cognizance of this fact and expressed some concern over the results such competition is likely to have.

George Weber, president of the Weber Automobile & Implement Co., Hupmobile distributors, who has just been elected president of the St. Louis A. D. A. told the members of the association that his company had always insisted that automobile finance companies doing business through his firm turn back to him all repossessed cars to be sold through the Weber Company to avoid setting up a competitor and at the same time retain supervision over all Hupmobile sales.

Repossessions here have been no heavier than usual lately but used cars have not moved any too rapidly because of the backward spring.

Studebaker Sales Gain in Important Centers

CHICAGO, May 18—New York and Chicago broke all records in the purchase of Studebaker cars during April, the Studebaker Corp. of America announces. Retail deliveries in New York were in excess of \$1,500,000, an increase of 36 per cent over April, 1925. Chicago sales amounted to \$1,125,000, or 25 per cent more than the same month last year. In both cities the volume was the largest of any month in history.

Hercules Builds 175 Daily

EVANSVILLE, IND., May 15—The automotive department of the Hercules Corp. will build 3500 truck bodies this month, C. W. Sanford, superintendent, announced. The department is employing 900 men building 175 daily.

John R. Lee is Named to Head Dodge Sales

New Executive Was Formerly Assistant in Charge—Former Officials Reappointed

DETROIT, May 15—John R. Lee was appointed general sales manager of Dodge Brothers, Inc., today, by E. G. Wilmer, president. He succeeds Robert Graham who retired several weeks ago, when the Graham brothers sold their interests to Dillon, Read & Co.

For several years Mr. Lee held the position of assistant to the president of Dodge Brothers, Inc., and, since last December has been assistant sales manager.

Three assistant general sales managers were appointed to serve with Mr. Lee. They are: H. J. New, formerly director of distribution; W. M. Purves, former division sales manager, and F. R. Valpay, former director of the commercial car and truck division. Mr. New's duties will embrace agreements and distribution, Mr. Purves will be in charge of districts and field operations, and Mr. Valpay will concentrate on Dodge Brothers commercial car and Graham Brothers truck sales.

Speaking of Mr. Lee's appointment, President Wilmer said, "Since the assumption of my duties here in Detroit, I have made a careful and deliberate appraisal of our sales department with a view to naming a leader in whom I have personal confidence and whose methods and purposes coincide with mine."

"I take pleasure in announcing the appointment of John R. Lee as general sales manager, and to assure you that he will have my personal support and assistance in the performance of his duties and in working out an effective sales administration."

Officials Long Experienced

Announcing a number of other appointments in the sales organization, President Wilmer declared: "I feel this is a strong, capable organization. It is composed entirely of men who have been on the firing line for Dodge Brothers, Inc., for long periods, men who know their work, their product and their dealers."

Other appointments announced, follow:

Percy Owen, director of foreign sales; W. R. Heilman, director of commercial car and truck sales; A. H. Schiappacasse, director used car sales; A. E. Nafe, director national business fleet sales; H. M. Wiegand, director of service; F. C. Bester, director of system; H. J. Koch, director of advertising and publicity, and W. J. Case, director of distribution. With the exception of Mr. Heilman, who returns to the home office after some time in the field as division sales manager, and Mr. Case, who has been the Detroit district representative, the executives named have been functioning for some time in the capacities indicated by the titles.

States to Regulate Bridge-Tunnel Buses

WASHINGTON, May 15—Regulation of interstate passenger bus traffic through the Holland tunnel between New York and Jersey City, and over the Philadelphia-Camden bridge across the Delaware River, is provided for under the terms of a bill which was passed this week by the Senate.

The measure, introduced by Senator Reed, of Pennsylvania, gives to the State authorities of New York, Pennsylvania and New Jersey control of all vehicular traffic which will pass through these two arterial highways, both of which will soon be completed. The right of appeal from decisions of such authorities, however, is vested in the Interstate Commerce Commission.

The provisions of the measure prohibits the operation of a passenger bus in interstate commerce through the tunnel or over the bridge until a license has been issued by the Transit Commission of New York and the Board of Public Utilities Commissioners of New Jersey in the one case and by the New Jersey board and the Pennsylvania Public Service Commission in the other. These authorities are given power to regulate the number of buses and conditions of operation.

Quits Gloves for Tires

CARROLLTON, OHIO, May 15—Tuscan Tire & Rubber Co. is operating at capacity using day and night shifts. Production at present is in excess of 400 tires a day. Until recently this factory devoted much of its time to the manufacture of drug sundries and surgical gloves neglecting tire production.

Coming Feature Issue of Chilton Class Journal Publication

June 10—Automotive Industries Annual Engineering Issue.

Bonfire Sessions Feature of Agricultural Meeting

ST. JOSEPH, MICH., May 17—Two of the sessions of twentieth annual meeting of the American Society of Agricultural Engineers will be held around a bonfire. The meeting is scheduled for June 23 to 26 at Tahoe Tavern, Lake Tahoe, Calif., the tentative program including many speakers of national note in the farm field. Four inspection trips have been arranged following the meeting, these including the hydro-electric developments in the Sierra Nevadas; through the northern Sacramento Valley and the delta district of the Sacramento and San Joaquin rivers, and through the Modesto and Turlock irrigation districts.

To Offer Traffic Course

DETROIT, May 14—A special course in traffic and safety engineering will soon be offered at the University of Michigan, Ernest Greenwood, executive secretary of the National Conference on Street and Highway Safety, told members of the Detroit Engineering Society at their monthly meeting.

Mr. Greenwood told the engineers that he had just succeeded in raising a fund which will amount to \$75,000 to \$100,000, annually, to finance the course. He declared that details would be released later, after the entire plan has been worked out.

Pennsylvania S.A.E. Studies Universals

PHILADELPHIA, May 14—At a meeting of the Pennsylvania Section of the S.A.E. this week, the following officers were declared elected for the ensuing year as a result of a letter ballot conducted since the meeting last month: Chairman, E. W. Templin, Six Wheel Co.; vice-chairman, Albert G. Metz, Chilton Class Journal Co.; treasurer, T. O. Day, Yellow Cab Co., of Philadelphia; secretary, Adolph Gelpke, Autocar Co., re-elected.

Last night's meeting was the final one of the present season. The next meeting will be held in September.

The general subject discussed was universal joints and the paper of the evening was presented by C. W. Spicer, vice-president, Spicer Mfg. Co. Mr. Spicer first gave a review of the theory upon which universal joints work and then followed with detailed descriptions of many of the different types of universal joints that have been designed during the past twenty years. His talk was profusely illustrated with lantern slides and made a very interesting and enlightening discussion of advantages and disadvantages of the various types of joints, how they operate, and for what particular service they are best adapted.

Rim Company Near Start

CANTON, OHIO, May 15—Approximately 5000 automobile tire rims will be the daily output of the Wheel Products Corp., which will begin operations in Canton within a short time, it is announced. The new company will use a minimum of 40 tons of steel daily. About 100 men will be employed at the start, officials said.

Calendar of Coming Events

SHOWS

- May 25—International Exhibition of Roads, Transport and Touring. Show Grounds, Argentine Rural Society, Palermo, Buenos Aires.
- June 10-20—Third Annual Automobile, Motor Cycle and Cycle Exposition, Geneva.
- July 28—First Peruvian Automobile Show, under auspices Peruvian Touring Club, Lima.
- Sept. 7-10—6th Annual New Haven Machine Tool Exhibition.
- Sept.—Fifth International Road Congress and Exposition, Milan.
- Sept.—Automobile Show, Prague.
- Oct. 4-9—Olympia Motor Cycle Show, London.
- Oct. 7-17—Auto Salon, Grand Palais Paris.
- Oct. 21-30—Olympia Show, London.
- Nov. 8-13—Convention and Show. Automotive Equipment Association, Coliseum, Chicago.
- Dec.—Show at Brussels.
- End of 1926—Show at Berlin.

CONVENTIONS

- May 28-29—National Motor Regrinders and Rebuilders Association, Indianapolis.

- June 7-8—Annual convention of the American Automobile Association, New Palmer House, Chicago.
- June 7-12—Annual United States good roads show and convention, direction United States Good Roads Association, Inc., and Bankhead National Highway Association, Santa Monica.
- June 8-10—Automobile Body Builders Association with manufacturers' exhibit, Detroit, Hotel Statler.
- June 14-19—Automotive Equipment Association, Mount Royal Hotel, Montreal, Canada.
- June 15-16—N. A. C. C. factory service manager's meeting at the Book-Cadillac Hotel, Detroit.
- June 16-18—Thirteenth National Convention, Society of Industrial Engineers, Philadelphia, Bellevue-Stratford Hotel.
- Oct. 4-8—45th Annual Convention, American Electric Railway Association and manufacturers' exhibit, Cleveland Public Auditorium and Annex.
- Nov. 8-13—Annual convention Automotive Equipment Association, Coliseum, Chicago.
- Nov. 13—Annual Meeting Associated Manufacturers of Fabric Auto Equipment, Inc., La Salle Hotel, Chicago.

- Nov. 15-19—National Standard Parts Association convention and exhibit, Hotel Sherman, Chicago.
- Nov. 16-18—National Tire Dealers Association, Inc., Memphis, Tenn.

RACES

- May 30-31—500-mile race, Indianapolis.
- June 12—Flag Day races, Altoona Speedway.
- June 12-13—Rudge-Whitworth 24-hour stock car race, Le Mans, France.
- June 27—French Grand Prix, Miramas Track, Marseilles.
- Aug. 23—Charlotte, N. C.
- Sept. 6—Labor Day races, Altoona Speedway.
- Oct. 9—Atlantic City.

S. A. E. MEETINGS National

- June 1-4—Semi-annual meeting, French Lick Springs, Ind.
- Sept. 2-3—Aeronautical Meeting, Bellevue-Stratford Hotel, Philadelphia.
- Sept. 21-23—Production Engineering meeting, Hotel Sherman, Chicago.
- Nov. 16-18—National Transportation and Service meeting, Boston.